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H. M. S. ENTERPRISE

Entering Dolphin and Union Strait, Sept. 1852.

*Drawn by F. Bedwell, Esq. R.N. from original sketches.*

# JOURNAL

OF

# H.M.S. ENTERPRISE,

ON THE

EXPEDITION IN SEARCH OF SIR JOHN FRANKLIN'S SHIPS BY BEHRING STRAIT.

## 1850-55.

BY

CAPTAIN RICHARD COLLINSON, C.B., R.N.,

COMMANDER OF THE EXPEDITION.

With a Memoir of his other Services.

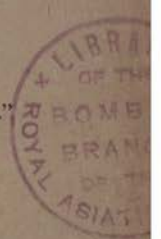
84437

*EDITED BY HIS BROTHER,*

MAJOR-GENERAL T. B. COLLINSON (Royal Engineers).

'Tis not in mortals to command success,
But we'll do more, Sempronius, we'll deserve it.
Addison's "*Cato*."

X-6-44



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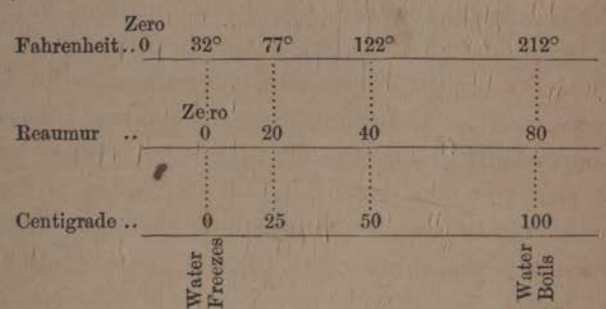
## MEMORANDUM.

THE THERMOMETER is reckoned by the Fahrenheit scale, unless otherwise stated.

COMPARISON OF THERMOMETRIC SCALES (from *Chambers's Encyclopædia*):




THE MILES are Geographical miles, 60 to a degree of latitude, unless otherwise stated.

WINDS are designated by the direction from which they come.

CURRENTS are designated by the direction in which they go.

SHIPS AND NATIVE WORDS are printed in Italics.

*** The following letter from ADMIRAL SIR G. H. RICHARDS to the Editor, written after perusal of the proof-sheets of this book, is here inserted with his permission; and forms a fitting though perhaps too kindly a preface to it.

---

56, LEXHAM GARDENS,
*October 2nd*, 1889.

When I first knew that it was your intention to publish the Arctic Journal of the *Enterprise*, I confess that I almost doubted the wisdom of the step, after the lapse of nearly forty years: since then, through your kindness, I have had the opportunity of closely studying the proof-sheets as they have come from the press, and I do not hesitate to say, that my views on the subject have entirely changed. The work will not now probably awaken that thrilling interest in the mind of the general reader which it would have done had it been published at the time, when a strong feeling existed among almost all classes in favour of Arctic enterprise: but it is a record of patient endurance and unflagging perseverance, under difficulties and trials which have perhaps never been surpassed, and it cannot but prove a solid and brilliant addition to the many like deeds performed by the seamen of the navy of this country.

By those who knew your brother this narrative will, I believe, be recognized as a fitting monument of his whole life.

There are comparatively few who are competent to pronounce a correct verdict on the merits of the various Arctic Voyages of modern times; fewer still perhaps at the present time who can form an entirely unbiassed judgment.

My own view has always been that the voyage of the *Enterprise* was the most remarkable of them all. There was no turning back, nor, in the mind of the leader, any thought of turning back, until all resources had been exhausted. In its relation, no exaggerated or sensational pictures are drawn: a plain unvarnished tale, almost too plain. Of how many others can this be said?

When, in the spring of 1853, Kellett's parties from Melville Island joined hands with M'Clure's at Banks Land, over 180 miles of frozen sea, and when a messenger from the latter was pushed on to Beechy Island by sledge, and by a piece of good fortune carried on to England the same year, the whole country rang with the discovery of the North-West Passage, which in reality was not the discovery; the voyage of the *Investigator* was indeed unique, and stands alone in the annals of Arctic discovery; she reached from the west within 120 miles of the furthest of Parry's ships from the east, more than thirty years before. Her meeting with the travelling parties from the *Resolute* was the single instance where pre-arrangement for combination in Arctic service had proved successful; and but for this meeting her crew would in all human probability have met with a similar fate to those of Franklin's a few years earlier; but they could no more be said to have discovered the North-West Passage than could that great Arctic navigator in 1846. Honours were conferred, and deservedly so, on M'Clure, Collinson's gallant second, for his daring and successful enterprise; but why the leader was thrown into the cold shade of neglect, almost of contumely, when two years later he returned having accomplished far more, and was only unfortunate in not finding Franklin's parties (as M'Clure had found

Kellett's) when he reached almost in sight of their lost ships, is only to be accounted for by one of those gusts of popular impulse, which at times blind men's understandings, and obliterate their better judgment, until in the end injustice becomes more expedient than honourable recantation.

Your brother was too modest a man to seek to have his own claims asserted, and he maintained a dignified silence under treatment happily rare in the Navy (for which, however, an *amende* was made after long years *): he was far too generous and unselfish not to concur and to rejoice in the honours which were bestowed on his second, who, but for his chief's unsuspicious and trusting nature would never have had the opportunity of making himself famous.

In awarding the palm for the discovery of the North-West Passage there were susceptibilities to be studied, which the men of the time were not strong enough to disregard, and a compromise was offered which history will not ratify; but will probably pronounce the verdict that the Passage has not been accomplished at all; that the most northern route between the two oceans was found to exist but not navigated, by the combined efforts of Parry in 1819 and M'Clure in 1852, and the more southern one by Franklin in 1846 and Collinson in 1853; two of the parties not living to know the completion of their labours.

It is no injustice to the gallant men who traced the intermediate portions of the Arctic Seas by boat or sledge (including Franklin himself), from Hearne and Mackenzie to Rae, to exclude them from any direct claim to the discovery of the North-West Passage; it is no detraction from their labours and their sufferings, which will be remembered until Arctic history is forgotten.

Believe me, very faithfully yours,

(Signed) GEO. HENRY RICHARDS.

* See p. 500.

# The Ancient Mariner.

And now there came both mist and snow,
And it grew wondrous cold;
And ice, mast high, came floating by,
Green as an emerald.

And through the drifts the snowy clifts
Did send a dismal sheen,
Nor shapes of men nor beasts we ken—
The ice was all between.

The ice was here, the ice was there,
The ice was all around,
It cracked and growled, it roared and howled,
Like noises in a swound!

At length did cross an albatross,
Through the fog it came;
As if it had been a Christian soul,
We hailed it in God's name.

* * * * *

The ice did split with a thunder-fit;
The helmsman steered us through!

—Coleridge.

# JOURNAL OF H.M.S. ENTERPRISE.

1850–1855.

## PROLOGUE TO THE JOURNAL.

THE story of the ill-fated expedition of Sir John Franklin to discover the long-sought North-west Passage in 1845, and of his mysterious disappearance, and of all the painful and laborious endeavours made to find him for ten long years, would form a subject for "An Arctic Epic" to some British poet. In the dark and dreary region, spread with thick fields and mountain heaps of impenetrable ice; in the numbing cold; in the dead silence of space where scarcely the foot of man or beast has trod since it was created, fitly called by the natives "The Land of the White Bear," and of him only; in the daily hard labour of advancing a few miles on little food, a constant struggle for life against the bitter elements; and perhaps most of all in the imprisonment of dim-lighted cabins for three or four months out of the twelve in each year, the poet would find abundant illustrations of the daring and endurance, and the skill and the self-sacrifice of British sailors, both officers and men.

To attempt any such undertaking is as much beyond the powers of the present writer as it is beyond the scope of this book. The only object proposed in the following pages is to place on record the story of one of those many unsuccessful endeavours, in the very words put down by the commander of it from time to time during its progress. And the excuse for venturing to bring an Arctic subject before the public again, after all these years of silence, is chiefly in the fact

that it is one of the few of those expeditions which have not been so recorded; thus leaving a sort of hiatus in the story of that epos, a small blank which was due mainly to the character of that commander, who, from certain circumstances, was most unwilling to put himself and his work in any way before the public. Now, however, that the commander has himself gone to that haven where neither cold nor heat nor storm nor stillness will trouble him any more, it has seemed desirable to some friends and comrades of his life that the blank should be filled up. And this is done gladly by his relatives as a further memorial of that life and character. It is hoped that its being given in the precise form in which it was periodically written by himself, will, in the eyes of the reader, be an additional interest and excuse for publication.

The general story of that weary search for the lost expedition, fruitless till the last forlorn hope, was told at the time so fully by many hands, that it is only necessary now to give a brief abstract of it, for the convenience of the reader, and for the better understanding of the origin and object of the particular expedition herein narrated.

The *Erebus* and *Terror*, under Sir John Franklin and Captain Crozier, went into the Arctic seas in the summer of 1845, by way of Baffin Bay and Lancaster Sound, under instructions to try and penetrate westward and southward, in the direction of Behring Strait. As they were fully provisioned for three years, no great anxiety was felt about them in 1846 and 1847. But when nothing was heard in the course of the latter year, the general feeling among all classes, scientific, naval and official, induced the Government to send two other vessels, which were the same two whose subsequent voyage is herein recorded, the *Enterprise* and the *Investigator*, under Captain Sir James Ross and Captain Bird, to follow on Sir John Franklin's route. This expedition experienced one of the most unfortunate lots that ever befell Arctic voyagers. Starting in June, 1848, they only succeeded during that season in penetrating Lancaster Sound and Barrow Straits as far as Port Leopold. During the winter they explored the north part of Peel Sound and Prince

Regent's Inlet, without finding any trace of the two missing ships; and in 1849 they were still more unlucky, for they got caught in the ice-floes, and carried out by the drift, *nolens volens*, into Baffin Bay, whereupon Sir James Ross thought it better to come home.

As the three years for which Sir J. Franklin's expedition was provisioned were now passed, the failure to obtain any account whatever of it from any source, roused a strong feeling in the country, and the Government responded to that feeling by determining to prosecute a vigorous search both from the side of Baffin Bay, and from Behring Strait.

Sir James Ross's two ships, the *Enterprise* and *Investigator*, were refitted with all haste, to sail as soon as possible round Cape Horn to Behring Strait, and Captain Collinson and Commander Maclure were appointed to them. And in the course of 1850, no less than four vessels were sent by Baffin Bay, the *Resolute*, the *Assistance*, the *Intrepid* and the *Pioneer* (two screw steamers), under Captain Austen and Captain Ommaney; in addition to which several other vessels were sent by private enterprise.

First must be mentioned the *Prince Albert*, under Captain Forsyth, sent by the talented and devoted Lady Franklin, whose name is almost as much associated with the Arctic seas as that of her unfortunate husband. This vessel went by Baffin Bay. Then Mr. W. Penny, an experienced Arctic voyager, was authorised by the Admiralty to take two small vessels, the *Lady Franklin* and the *Sophia*, in the same direction. Then also, the old Arctic navigator, Sir John Ross, was not to be left behind; he took two small vessels, the *Felix* and *Mary*, in the same direction. And finally, a generous and sympathetic citizen of the United States, Mr. Grinnell, sent two vessels, the *Advance* and the *Rescue*, up the same way.

Besides all these, H.M.S. *Plover* was stationed at Behring Strait under Commander Moore, and the *Herald* under Capt. Kellett, then surveying in the North Pacific, was ordered to assist on that side. And further, it should have been mentioned, the Government had authorised the Hudson's Bay Company to send special parties to the north coast of

America, of whom two noted explorers, Sir John Richardson and Dr. Rae, went in 1848, and the latter remained in those parts until 1851.

Thus, in the season of 1850, there were in all fifteen vessels taking part in the search for Sir John Franklin's expedition: eleven on the Baffin Bay side, and four on the Behring Strait side, besides one or two land parties. It was, therefore, reasonably to be hoped that in the course of that year or the subsequent year all questions concerning the Arctic seas; not only the fate of Sir John Franklin's party, but the moving cause of all such expeditions, the North-west Passage, would be cleared up. How far they all failed in elucidating the former will appear in the course of the narrative. It will probably be generally agreed upon, now that the glamour of the North-west Passage is somewhat faded, that the fortunate settlement of that question, does not compensate for the failure to save Sir John Franklin's party, which we know now might have been accomplished.

## Enterprise and Investigator Expedition.

As the general idea upon which all these search expeditions were started has been given, we can now bring the *dramatis personæ* on the stage, and give the outline of the plot of the particular search expedition by way of Behring Strait which forms the subject of this book.

The *Enterprise* and *Investigator* returned from Baffin Bay in November, 1849; and in the beginning of December they were ordered to be refitted for the voyage to Behring Strait: no loss of time in that respect. It was the strategy that was unfortunate, not the equipment; these two small sailing vessels (of about 380 tons and 340 tons respectively) built and strengthened to resist the crushing ice, and therefore necessarily sluggards in a seaway, were expected to traverse the Atlantic, round the stormy Horn, and run the length of the Pacific, up to Behring Strait, a distance of about 20,000 miles, between January 20th and August 1st, a period of a little less than 200 days; a narrow calculation for such vessels

going over such a course; the only assistance given them being some inefficient steam power through the Straits of Magellan. Had there been a predetermination to follow up Franklin from the first, as he was followed up afterwards, the subsequent costly expeditions would not have been needed.

The two vessels did leave the River Thames January 11th, 1850, and parted finally from England at Plymouth January 20th. The *Investigator* proving slower than her companion, they separated, to meet again at the Straits of Magellan; after which they parted again, to meet no more. The *Enterprise* arrived at the rendezvous in Behring Strait about the middle of August, to find that her slow consort by a fortunate boldness had got before her, and had gone into the Arctic sea, but that she herself was already too late, the ice gate at Point Barrow being closed for that season. If a month's steam towing could have been applied on this occasion it would have made the difference between success and failure in the object of the search.

The *Enterprise* wintered at Hong Kong for the sake of the climate and the supplies, and returned to the ice gate in good time in 1851, that is to say in the middle of July; and in the course of the next two months was fortunate in penetrating along the north coast of America and up the Prince of Wales Straits; but only to find that her consort had been able to do exactly the same thing in the year before, and had thereby become the discoverer of the last link in the long laboured chain of the "North-west Passage." The *Enterprise*, unable, as was her consort, to cross the narrow ice barrier that prevented the completion of the passage, tried back southward and round the west side of Banks Island; and there again found that her consort was before her, but never came up to her, and never knew till three years after that the *Investigator* was left on the north side of that island, a monument of her own discovery. Finally the *Enterprise* wintered at the south end of Prince of Wales Straits.

In the spring of 1852,—in those seas the spring is the season for explorations with sledging parties over the ice; not

a work of swiftly sliding over smooth surface, but of slow and painful dragging of heavy loads amid frozen waves of huge hard ice blocks,—in this spring, the parties from the *Enterprise* explored the coasts adjacent to the Prince of Wales Straits, and one officer succeeded in crossing to Melville Island, but by a fatality that seems inherent to Arctic voyages, he just missed communicating both with the records of the exploring parties from Baffin Bay expeditions, and with those of the *Investigator*.

In the summer of 1852—the season practicable for sailing in the Arctic sea; that is to say, the months of August and September—the *Enterprise*, having failed to get north or west, succeeded in working her way through the narrow channel along the north coast of America to the eastward as far as Cambridge Bay—a voyage of no small difficulty, owing to the dense fogs and non-effective compass—and wintered there.

In the spring of 1853, the sledge parties of the *Enterprise* made their painful way up Victoria Straits as far as Gateshead Island, and once more found that they had been forestalled, this time by the indefatigable Dr. Rae (of the Hudson's Bay Company). Finding also that the strength of their sledge party was not equal to the ruggedness of the great ice hummocks in that part of the strait, they returned. Thus by a like mischance to Dr. Rae's, by going along the west side of the strait instead of the east, they both missed the discovery of the remains of Franklin's expedition, which were found there by Captain M'Clintock four years after.

But the *Enterprise* would have remained another winter, and would have attempted the passage through Victoria Straits to the north, if it had not been for the discovery, just at that time, that the supply of coal put on board in England was short of what had been intended: they were therefore obliged to retreat westward to a part of the coast where drift-wood for fuel could be procured. This was a great disappointment, because otherwise both ship and crew were in good condition for work.

In the summer of 1853, therefore, they worked back through the narrow difficult passage westward, but were stopped by the beginning of the winter ice in Camden Bay, near Point Barrow, and thus compelled to remain one more winter in the isolation of the Arctic sea; fortunately with a good supply of drift-wood.

In the spring of 1854, an attempt was made to explore by a sledge party due northward into the open sea; but the quantity and ruggedness of the ice hummocks, 30 feet high, proved too great a difficulty. In the summer of that year, the *Enterprise* at last came through the ice gate again, and communicated once more with the civilised world, after a complete isolation of more than three full years. Even then her commander had the intention of returning into the ice after completing with fuel and provisions, to look after his lost consort, of whose fate, and of the rescue of the crew by the expeditions sent in 1852 by Baffin Bay, he first heard at Behring Strait. She then returned home by way of China and the Cape of Good Hope, and having thus circumnavigated the globe, as well as endured that unusually long seclusion in the Arctic seas, she reached England in May, 1855, an absence of five years and four months, sound in herself and healthy in her crew.

And not to find the lost ships after all! after all that long endurance, that anxious navigation, that laborious sledge searching, nothing, not a record, not a rumour of the missing expedition, except one small piece of wood, picked up in Cambridge Bay: a bit of a cabin door, thought so doubtful at the time as to afford no guide to further search, but which subsequent knowledge seems to show had certainly drifted from the *Erebus* and *Terror*, when they broke up in Victoria Straits in 1848. The most distressing rebuffs in these searches were due to following up vague reports leading only to disappointment, and to the missing of slight clues which proved afterwards to be correct indicators. A fatality seemed to dog the steps of every expedition in those years of search, by which they were led away from the true direction, and which was in great measure caused by the

absence, at the starting of Franklin himself, of all provision for following him up if necessary.

But if the *Enterprise* failed, as they all failed, in the great object of the voyage, she had some special results to look back upon with peculiar satisfaction. Alone and entirely on her own resources she had remained for more than three full years in those trying seas, and had penetrated further in the true direction of the search than any other vessel; in the course of which she had shown the practicability of navigating along the whole of the north coast of America, and had further demonstrated that to be the only probable line, difficult as it is, by which a North-west Passage can ever hope to be accomplished; then she had got herself nearer than any other vessel to the most advanced position of any ships from the other side, and moreover in two different lines of passage: first, by Prince of Wales Straits to Parry's ship (the *Hecla*, 1821), and second, by Victoria Straits to Franklin's ship (1848); and lastly, after this long trial, she had brought herself home with her crew in good health—a result of no slight consideration, when we know that in the course of those same years no less than five of Her Majesty's ships were abandoned in those same Arctic seas, and their crews conveyed home in other vessels.

When we look through the pages of this Journal to discover a cause for this exceptional endurance of man and ship, we do not find much of a character different from other expeditions at the time, either in the life or work of the *Enterprise*. We find, indeed, throughout the Journal, as also in his private letters, continual evidence of the devout feeling of the commander in expressions of gratitude to Almighty God for the preservation of their lives on many an occasion of extreme peril, from the crushing of the ship between masses of ice, and for the welfare of the crew in times of severe trial from hard work and exposure. Such expressions must naturally rise in the heart of any commander who has to meet the frequent risk of life and death to all his crew that is present in Arctic voyaging; but there is something more than that in the tone of the Journal. It

is the tone of a man who feels that he has the power to cope with the difficulties before him as far as man can do, and yet such a sense of the beneficence of the Almighty Ruler, that he can preserve a courageous cheerfulness throughout dangers which seem beyond man's capacity; and we know that in ships, and especially in Her Majesty's ships, it is the commander who gives the tone to the whole vessel. Something, therefore, notwithstanding all arrangements of food and warmth and amusements, must be allowed to the character of the captain for the condition and tone of the crew during those five years.

## State of Arctic Knowledge in 1850.

It will probably be convenient to the reader to have recorded here the state of knowledge about the Arctic seas where Sir John Franklin went, at the time of the departure of the *Enterprise* and *Investigator*.

*On the eastern or Baffin Bay side,* little more was known than had been discovered by Captain Parry in 1821: that is to say, that there existed a navigable channel by Lancaster Sound and Barrow Strait to Melville Island, with several large openings leading from it northwards, also navigable to all appearance; and on the south side of it, a navigable channel, Prince Regent's Inlet, leading down as far as the Gulf of Boothia; and another inlet, Peel Sound, was added by Captain Sir James Ross in 1848, and believed to be closed at the south end. From Melville Island Parry had seen Banks Land 60 miles to the south-west.

*On the western or Behring Strait side,* the coast of Asia and North America was known, but (except one island discovered by the *Herald* in 1849) as far as could be judged, there was an extensive sea north of it, from Behring Strait to Cape Bathurst (long. 128° W.). This was presumed from the character of the ice, which is exceedingly massive, up to 40 feet in thickness, and forced by the action of successive seasons, breaking up the fields of ice and jamming them against each other, into ridges of hard blocks, 30, 50, and

even 100 feet high; indicating in many cases an action of many seasons. This character of ice has been always found associated with large seas, within the Arctic circle.

It must also be noticed, that during the Arctic summer, the navigable summer, there is almost always a lane of open water along this coast, between the solid fields of ice and the shore, varying in breadth from 3 or 4 to 50 and even 100 miles. This is kept open partly by the stream of warmer water always flowing from Behring Strait eastward, and partly by the warmer fresh water coming down the American rivers. Sailing vessels have to steer and tack their cautious way along this lane, avoiding on the one hand the shoals and rocks of the coast, and on the other the moving floes of ice detached from the main pack. The breaking away of these floes leaves lanes and pools of water in the pack, which entice vessels astray for days into blind alleys. Sailing vessels thus lose many days which a steamer would save, and a steamer can force her way through floes which stop a sailing-ship.

In Arctic language, a *floe* is a detached piece of ice, though it may be a mile across; when these floes are frozen together into one extensive and immovable field, it is called *the pack.*

*On the south or American side,* besides the actual coast-line, it was known that there was land opposite to it, from the Coppermine River to the Back River, forming for the most part a narrow channel along which only boats had as yet passed. The region between this channel and the northern channel (Barrow Strait) was unknown, and it was into this that Franklin was directed to go.

Thus we may say that in 1850, while the eleven ships on the Baffin Bay side were to search from the north and east of this region, the four ships on the Behring Strait side were to attack the same region from the south and west side.

## The Call to Action.

Captain Collinson had returned in 1846 from service in the Chinese War of 1840–3, and from the survey of the coast

of China, and was staying at his father's house (The Rectory, Boldon, co. Durham), in 1849, when he received the following very unexpected note from his hydrographic chief and good friend Captain Beaufort:—

"Admiralty, Dec. 10, 1849.

"DEAR COLLINSON,

"It has been finally determined that the *Enterprise* and *Investigator* should renew their search for the *Erebus* and *Terror*, but now by Behring Strait instead of by Baffin Bay, and they are therefore preparing with the greatest despatch, as there will not be more than sufficient time to ensure their reaching the ice by the 1st of August. There will be a commander to each ship, and a captain to command the expedition, and I am desired by their Lordships to offer *that berth to you.*

"Nothing can be more flattering than such an offer as touching their confidence in your talents and zeal—and if you assent I would suggest to you the propriety of coming as soon as possible to

"Yours truly,

"F. BEAUFORT."

One can readily imagine the excitement produced in the pleasant country parsonage by such a note, and the conflicting feelings brought out by it. At that time the search for Sir John Franklin and the discovery of the North-west Passage, was the one great enterprise in the minds of the naval world in this country, and the desire to take part in it was strong among all officers who by any previous service had any sort of claim to be considered in the selection. But the friends of the aspirants did not always look upon it with the same feeling: the Arctic Sea was still a *mare incognitum*, replete with dangers unusual even to the British sailor, more terrible than those of war, and without its glory and its profit. Added to these drawbacks, there was, in this case, the knowledge that the age and infirmities of the father and mother made a long and uncertain absence almost like a final separation. But again, in this case, the father was one

whose sense of duty was as strong as his trust in the Divine protection, and the mother's high spirit and imagination controlled the natural affection of her age and disposition.

So the result was that the captain left the same day for London to accept the appointment, with expressions from his home that may be judged from another note received by his father two days after from Captain Beaufort:—"nothing could be more confident than their Lordships, that whatever can be done by skill and energy, and by high and noble feeling will be achieved by him—and if anything were wanting to rouse and stimulate those feelings, he would have it in the encouraging voice of his affectionate but patriotic father and mother."

Part of these hopeful anticipations were fulfilled in the safe return of the *Enterprise* after an unexampled voyage, and in the presence of an almost unbroken family to greet the commander. But

> "Half the prayer was granted by the gods,
> The other half dispersed among the winds,"

as we shall see. The ships were too hastily equipped, one of the most serious deficiencies (as it turned out) being the absence of the second commander of the *Enterprise;* these and other ill-fortunes turned what might have been the one fully successful expedition of the search, into two disjointed and unlucky failures.

One more letter from Captain Beaufort—the last of his many kind services to Richard Collinson, for he retired from his post before the return of the *Enterprise*—written on the eve of its departure, shows the deep interest he took in its present expedition, and the warm-heartedness of the chief towards his young surveying friend.

"Admiralty, Jan. 15, 1850.

"MY DEAR COLLINSON,

"I was in hopes to have found a quiet half-hour for saying a few last words to you on the eve of a voyage in which I feel far more deeply interested than in any that memory brings to my recollection. It was a bantling of my own; its

object a noble effort of national humanity; its means as perfect as we have had time and wit to make them; its rewards the glowing sympathy of every man, woman and child in the country, and indeed in all countries: and all this in the hands of a man whose career I have marked with more than common interest; whose conduct while connected with this department has been one continuous course of cheerful and fruitful effort to do even more than his duty; with whose family I feel it a source of pride to be acquainted; and on whose friendship I joyfully reckon, if I live long enough to enjoy it after his return.

"But I have not a peaceful moment for that purpose; and therefore many little things in the way of ideas and crotchets that have been germinating in my brains must remain there, unless indeed they may go halting across the Isthmus of Panama to you; I could not, however, let you go without giving you my blessing, and assuring you of the hearty friendship and affection of

"Yours faithfully,

"F. BEAUFORT.

"To the Baffin Bay vessels I shall give directions to have skilful riflemen prepared to bring down any balloon they may see coming from the westward.

"Give a cordial embrace for me to my beloved old friend Franklin."

ACKNOWLEDGMENTS.

In preparing this Journal for publication, it seemed desirable to supplement it with some notes, for the explanation of certain matters, which would not otherwise perhaps be clear to the ordinary reader, and also for the purpose of showing its connection with the other branches of the great search, going on at the same time. And in some cases these notes have been amplified so as to give the best information available as to the duties and arrangements peculiar to Arctic explorations, which it is hoped will add to the interest of the one expedition itself.

Towards this object, and in all matters connected with the

publication, the Editor has received most kind and valuable assistance and encouragement from such of the old Arctic notables as he had to apply to. The three foremost of these authorities to whom he is indebted are Lieut.-Colonel John Barrow, Admiral Sir George Richards, and Admiral Sir Leopold M'Clintock.

Admiral Sir George Richards is the highest living authority on Arctic subjects, from his great experience, and the high position (as hydrographer) he held at the time of the last Arctic expedition under Captain Nares. The Editor is indebted to his extensive knowledge and good judgment for much information and advice, especially in the compilation of the notes, without, it must be understood, making him responsible for any opinions therein expressed.

Lieut.-Colonel John Barrow was the friend and supporter of all the principal Arctic officers of the days of the search, as his eminent father, Sir John Barrow, was to the generation before that. He has placed at the Editor's use all the papers, books and articles in that house which is a museum of Arctic travel, and has in addition given him the kindly assistance of his own personal recollections and private papers concerning that period of Arctic exploration.

Admiral Sir Leopold M'Clintock won the prize in that great expedition of ten years' duration; like the wise Ulysses, after the mighty men of war had retired from the scene unsuccessful, he went in single-handed, and with the experience and knowledge of the past labours, followed direct on the clue already obtained, and cleared up the mystery of the lost ships; and well he deserved his fortune, by his long persistence in the search, and his assiduous exertions to improve the appliances towards it. He has given the Editor the benefit of his experience in various matters connected with Arctic exploration.

The Editor has also to thank the Admiralty for allowing him to resort to their archives for information, and not less the officers of that labyrinthine Record Office for their ungrudging trouble, and especially the hydrographer, Captain Wharton, for his ready assistance. He has been likewise greatly indebted

to the Royal Geographical Society for the permission to use their library and maps, and to the officers of the Royal United Service Institution for their kindly aid; and lastly, he has to thank various friends and public officers for help and advice.

## Books Consulted.

Some short notice of a few books relating to that period of Arctic explorations, and of some subsequent voyages, may be useful to future travellers in these regions.

### ON THE EXPEDITION ITSELF.

*Captain S. Osborn's North-west Passage.* Blackwood, 1856 and 1865.

*Dr. Armstrong's Narrative of Voyage of H.M.S. Investigator.* Hurst & Blackett, 1857.

These are the only two books hitherto published concerning that expedition by Behring Strait in 1850. They are both cleverly and amusingly written, and give graphic and perhaps rather too sensational descriptions of the adventures of the one ship they treat of. Osborn was quite qualified to talk about Arctic voyaging, having sailed with Austin in 1850, and Belcher in 1852; and Dr. Armstrong had scientific knowledge and power of description. Both books lose value by the exaggerated tone of laudation of the acts of the *Investigator* in discovering the North-west Passage, which runs throughout them to the exclusion of the real object of the search, and by the unwarrantable freedom of their criticisms on their superior officers. Some of these on the commander of the expedition have been commented on in the notes to the Journal.

### ON THE SEARCH GENERALLY.

*Mr. J. Brown's Search for Sir J. Franklin.* Stanford, 1860.

This should be first mentioned, as it contains the most complete and carefully compiled account of the whole business that has been published. Having been commenced

before the search was completed, there is a good deal of criticism and conjecture which became obsolete when the addition was made to it of M'Clintock's final voyage. But the records appear accurate and the opinions were proved to be sound. The present Editor has been indebted to his fortunate acquaintance with Mr. Brown's son, Mr. J. Allen Brown, for his advantages in being able to study that useful record, and for other assistance in his work.

*Sir E. Belcher's Narrative of the Voyage of H.M.SS. Assistance and Resolute*, 1855.

This was the great search expedition on the eastern side, which was sent in 1852, and of which Captain Belcher was the commander. He was a clever nautical surveyor and had a very ingenious mind; but he certainly was not a good historian of expeditions. These two volumes are naturally occupied chiefly with the proceedings of his own division of the expedition; but the greater part of those consist of the sayings and doings and reflections of Sir Edward himself, and these are sometimes not remarkable for point or accuracy. Great allowance, however, must be made for his bad condition of health during the whole period; the same faults, though, are to be found in his former work, the account of the long exploratory voyage of H.M.S. *Sulphur* in the Pacific, 1835–42. Nevertheless there are a large number of observations collected in the Arctic book, on many matters, nautical, meteorological, geological, and others appertaining to that region, which will make it always a valuable addition to Arctic literature.

*Macdougall's Voyage of H.M.S. Resolute.* Longman, 1855.

Mr. Macdougall was master of the *Resolute* in the above great expedition of 1852–4; and, as one might expect from his wide and responsible duty, his book is valuable on account of the record of practical details of the various doings going on in and out of the ship during the voyage. These are given with such a plain painstaking accuracy, and on

such a variety of subjects, owing to his exceptional opportunities, that they will be always worth consulting by future voyagers in those seas.

*Osborn's Arctic Journal.* Blackwood, 1852 and 1865.

This is by the same Captain Sherard Osborn before mentioned, and contains various notes and reflections concerning his Arctic voyages and of the search generally. It is written in a pleasant, flowing, and somewhat sensational style, and may be considered as the popular account of the matter, and therefore to be taken *cum grano*—especially as regards the criticisms on his superior officers.

*M'Clintock's Discovery of the Remains of Sir J. Franklin's Expedition in the Fox.* Murray, 1859.

This, as the last act of that ten years' laborious search, and the successful one, will always be the most interesting of the whole series of records. Interesting also on account of the painful circumstances of its birth, and of its short but most eventful life, and of the valuable information compiled in it, as well as of the sad clearing up of that national episode. In the appendix is an exceedingly useful outline of Arctic geology, with a good geological map by the surgeon of the expedition, Professor Haughton, of the Dublin University.

*The Parliamentary Blue Books.*

During the whole period of the search there were issued from time to time, by the Government, records of the proceedings, in the form of the official reports of the officers, and their various notes of the transactions. Some of these were from committees of enquiry held upon certain of the expeditions, or from the formal courts-martial upon the commanding officers who had abandoned their ships in the ice.

These voluminous productions contain buried in their ample folds a quantity of detailed information on many subjects connected with Arctic travelling very valuable to such future voyagers as will go through the labour of extracting

the ore from the mass of matrix. A choice specimen is the one on Sir E. Belcher's expedition, containing the great sledge journeys to the north of the Parry Islands, and which is among Arctic books what an iceberg is among the floes of Baffin Bay.

### ON OTHER ARCTIC VOYAGES.

It had been the Editor's intention to give an abstract of the state of Arctic discovery at the present day, as it is some time since stock has been taken of that business, but the inexorable logic of the publisher cut off that idea in its prime. However, as some of the works consulted have been used in the Notes to the Journal, a brief account of them may be interesting and perhaps useful.

*Sir John Barrow's Arctic Voyages*, 1818 *to* 1846.

Sir John Barrow was the father of modern Arctic exploration; it was his devotion to the subject that revived the idea of it in this country, after the termination of the great war in 1815; and, as Secretary to the Admiralty for a great many years, he was of course greatly influential in inducing the Governments of the day to send out the expeditions both to the Arctic and Antarctic regions between that time and 1845, when Sir J. Franklin started on his last voyage. The student of Arctic travelling will find in this book good and interesting abstracts of the principal travels in that time: Parry's three voyages in 1819–27, the *Primus in Arctis;* Franklin and Dr. John Richardson and Captain Back to the North American Coast in 1819–27; and Back's two journeys in 1833 and 1836; Messrs. Dease and Simpson's boat voyages along the North American Coast in 1836–9; and Sir James Ross's expedition to the Antarctic in 1839–43.

*Payer's Voyage of the Tegethoff* (*Austrian Navy*), 1876. (English Translation.)

After the sorrowful issue of the Franklin search in 1859, there was a reaction against Arctic enterprise in this country; but Germany, Holland, Denmark and Sweden

carried it on to the North of Europe for scientific objects. And in 1871 and 1872 Austria-Hungary, on the pressure of scientific men, authorised two small expeditions in those parts, under the direction of Lieutenant Weyprecht, a very scientific officer, with Lieutenant Payer of the Austrian Navy to assist him, who wrote the account of the voyages. They reached, or rather were carried, frozen in the pack, to 82° north latitude, where they discovered a group of islands, which they properly called Franz Joseph Land after their Emperor; and then they had to abandon their ship and work a weary way in boats, over ice and water, to Nova Zembla: one more evidence of the inefficiency of small isolated expeditions for Arctic exploration. There were scientific results, no doubt, but hardly commensurate with the expenditure of body, mind and spirit.

*Nares's Expedition to the North of Smith's Sound*, 1875–6.

Great Britain was not going to be left behind altogether in the race to the North Pole. The continental expeditions, but more particularly those of the United States up Smith's Sound, stirred up the British sea lion, who had always considered the North Pole as his particular property. And by 1875 the woes of the great Franklin search were worn out, and a desire for action set in. The Government, moved by the representations of scientific societies, and feeling the national pulse, put out an expedition which for completeness in ships, in officers and in men, in scientific preparation and in general equipment, has probably never been equalled; and the two ships, the *Alert* and the *Discovery*, were taken up to the north end of that long channel beginning with Smith's Sound at the head of Baffin Bay. Never was one of the extensive family of Smith so immortalised as when Captain Baffin threw the name into what he thought was the end of all things in that quarter of the Polar regions; it has proved instead to be the beginning of everything, the gate of the highway to the Pole. But not even this splendid expedition was prepared to face two successive winters on the shore of a sea of perpetual mountain ice, in

the latitude of 83° north; and they had to retreat with little more than the satisfaction of demonstrating, as Captain Nares expressed it, that 60 miles of Polar pack are insuperable.

*Professor Nordenskiöld's Voyage from North Cape to Behring Strait.* (Translated.) Macmillan, 1881.

The Swedish professor had already made some voyages to the east coast of Greenland, and to Spitzbergen, from which he brought back a store of scientific observations, such as constitute the true fruits of Arctic travel. He was now seized with the desire of attempting the "North-east Passage," that is to say the voyage along the north coast of Europe and Asia, from the North Cape of Europe, to Behring Strait; which had never been accomplished, though often tried. In 1878 he started with one good steam vessel, the *Vega*, and three others accompanying part of the way; a private expedition with some help from the Government. And thanks to his own experience and to the favourable conditions of the Arctic Ocean on that coast, he nearly got through in one season; and did succeed in 1879, this being the first vessel that ever arrived on the Chinese coasts from Europe by the north. His book is a store of sound scientific observations on all subjects connected with those Arctic regions.

*Greely's Scientific Expedition by Smith's Sound.* United States, America, 1885.

The people of the United States had shown a decided interest in the search for Sir John Franklin, and various private expeditions were sent from that country during its progress, and subsequently, with the object of carrying on the exploration up Smith's Sound. Between 1856 and 1869 several expeditions under Kane, Hayes, and Hall penetrated up that channel; but being small and isolated and depending on private means (mainly from Mr. Grinnell, U.S.), they were inadequate for the enterprises they under took, and suffered great difficulties and privations.

In 1875 Lieutenant Weyprecht (Austrian Navy) had proposed a scheme of international observations in the Arctic and Antarctic regions; and after several conferences on the subject, it was agreed by the Governments of various states to carry on simultaneous scientific observations, meteorological and electric, at fourteen different stations, during the years 1881–2. The United States Government selected Discovery Bay (where Nares' consort ship wintered in 1875); and in 1881, under the direction of the Signal Department of the U.S. Army, a small party of three officers and twenty men were landed there. They were never relieved, owing to want of due arrangement, and had to make their way back to Smith's Sound in boats; eight survivors were rescued in the summer of 1884. Besides the observations for which purpose they were sent, they made some valuable explorations in Grinnell Land, and reached along the north coast of Greenland to the farthest north yet attained by man, 83° 23′ (3 miles farther than Markham in 1876).

The book is valuable from the interesting information contained in it; but readers of other countries must regret, when they take up the volumes, that the passion for hugeness in everything, which seems to be epidemical in the States, has now extended to their books.

*Captain de Long's (U.S.N.) Voyage North of Behring Strait*, 1879–81.

This is another example of attempting great undertakings with imperfect means; it was a partly private expedition, sprung from the adventurous disposition of the captain, under the influence of the temptation of open water north of Behring Strait, which offered a hope of reaching nearer to the Pole in that direction. He had not, however, realised the danger of the combined effect of the warm current coming through Behring Strait, meeting a colder current coming from the west. When they got north of Herald Island, they were caught in the pack, and drifted backwards and forwards for fifteen months, having made during that

time only 200 miles to the north-west of Herald Island. There they found some islands to the north of the New Siberian Isles; and there the ship was crushed by the ice, and they had to make their way in boats to the mainland of Siberia, landing on the delta of the River Lena. But out of a party of twenty-eight persons, twenty had perished from work, exposure, and hunger, before they found relief.

## ON ARCTIC GEOGRAPHY.

*Arctic Papers, published by the Royal Geographical Society*, 1875.

When Captain Nares' expedition was in preparation, both the Admiralty and the Royal Geographical Society compiled, from various sources, papers containing an epitome of the information then available on every subject connected with the Arctic regions. The book published by the latter body contains information suitable to the work of navigating and exploring, being obtained from the accounts of the principal voyagers in different parts of the Arctic seas. It is a sort of guide-book, complete (considering the short time allowed) up to that date. A full account of the Esquimos by Mr. Clements Markham (late secretary to the R.G.S.) is in it.

*The Arctic Manual, published by the Admiralty*, 1875.

This is a more ambitious work, and one of more lasting value. It contains scientific information and disquisition thereon by well-known experts of the day, on the various branches of natural science, as far as their action was at that time known, in the Arctic regions; and being divided into chapters according to the different branches—Meteorology (including tides and ice), Geography, Geology, Natural History, Electricity, &c.—it formed, and will form no doubt for a good many years to come, a valuable little encyclopedia of Arctic science.

*Sir John Richardson's Boat Expeditions, North Coast, America,* 1848–51.

*Sir John Richardson's Account of the Polar Regions,* 1861.

These two books, by that well-known scientific traveller of those days, contain much scientific information, on various branches of natural science, and ethnology, still most valuable to the Arctic traveller and student of Arctic regions.

## EXTRACTS FROM THE ADMIRALTY ORDERS TO CAPTAIN COLLINSON.

By the Commissioners for executing the Office of Lord High Admiral of the United Kingdom of Great Britain and Ireland, &c.

1. Whereas the efforts that have been made during the two last years to relieve the *Erebus* and *Terror* have failed, and all access to the Parry Islands has been prevented by the accumulation of ice in the upper part of Barrow Straits; and whereas it is possible that the same severity of weather may not prevail at the same time in both the eastern and western entrances to the Arctic Sea; we have now determined, in a matter of such moment, to send an expedition into the Polar Sea from the westward; and having a full confidence in your zeal and skill, we have thought proper to appoint you to the command of Her Majesty's ship *Enterprise*, and also to place under your orders Her Majesty's ship *Investigator*, both of which vessels having been duly fortified against collision with the ice, equipped for the Polar climate, by warm-air apparatus, and furnished with provisions for three years, as well as a large supply of extra stores; you are now required and directed, so soon as they are in all respects ready for sea, to proceed to make the best of your way to Cape Virgins, in order to arrive at Behring's Straits in July.

2. At Cape Virgins, the Commander-in-Chief in the Pacific has been desired to have a steam vessel waiting for you, and by her you will be towed through the Strait of Magellan and the Wellington Channel, and on to Valparaiso.

3. At that port, you will use the utmost dispatch in watering and refreshing your crews, and in fully replenishing your bread and other provisions and stores; and having so done, you will again use your best exertions to press forward to the Sandwich Islands.

4. There is only a bare possibility of your reaching those

Islands in time to meet with Her Majesty's ship *Herald*, under the command of Captain Henry Kellett, but if that should be the case you will receive from him not only every assistance, but much useful information touching your passage to the Strait, and your further proceedings to the northward. It is still more improbable that Her Majesty's ship *Plover*, should be there; but wherever you fall in with her, you are hereby directed to take her and Commander Moore under your orders.

5. At the Sandwich Islands you will find additional orders from us for your guidance, which we propose to forward from hence by the Panama Mail of next March; but if none should arrive, or if they do not in any way modify these directions, you will enforce the greatest diligence in revictualling your two vessels, in procuring if possible the necessary Esquimaux interpreters, and in making all requisite preparations for at once proceeding to Behring's Straits, in order to reach the ice before the 1st of August.

* * * * * *

7. We consider it essential that after entering the ice there should be a depôt or point of succour for any party to fall back upon. For this purpose, the *Plover* is to be secured in the most favourable quarter, as far in advance as can be found, such as Wainwright Inlet or the Creek at Hope Point, but if they be unsafe, and none other discovered nearer to Barrow's Point, then at Chamisso Island or any part of Kotzebue Sound which may afford the necessary shelter.

* * * * * *

12. On detaching the *Plover* to take up her winter quarters, you will direct Commander Moore to remain there until you join him, or, failing your return to him, until the end of the summer of 1853; when, but not till it is absolutely necessary for securing the *Plover's* passage through the Aleutian group of Islands, he is to quit Behring's Straits.

* * * * * *

14. In the event of your having to winter your ships on the continent or Esquimaux shores, you will probably meet with some of the wandering tribes, or with Indians. With

these you will cultivate a friendly feeling, by making them presents of those articles to which they are apt to attach a value; but you will take care not to suffer yourself to be surprised by them, but use every precaution, and be constantly on your guard against any treacherous attack. You will also, by offering rewards, to be paid in such a manner as you may be able to arrange, endeavour to prevail on them to carry to any of the settlements of the Hudson Bay Company an account of your proceedings, with an urgent request that it may be forwarded to England with the utmost possible dispatch.

* * * * * *

16. We leave it to your judgment and discretion as to the course to be pursued after passing Point Barrow, and on entering the ice; and you will be materially assisted in this respect by what you will learn from Captain Kellett, if he should be fallen in with at the Sandwich Islands, as well as from the observations of Sir Edward Parry and Captain Beechy, contained in the Memoranda of which we send you copies.

* * * * * *

17. You will further be supplied with all the printed Voyages and Travels in those Northern Regions; and the Memorandum and Instructions drawn up by Sir John Richardson as to the manners and habits of the Esquimaux, and the best mode of dealing with that people (a copy of which is also sent), will afford a valuable addition to the information now supplied to you.

18. We deem it right to caution you against suffering the two vessels under your orders to separate, except in the event of accident or unavoidable necessity; and we desire that you keep up the most unreserved communications with the commander of the *Investigator*, placing in him every proper confidence, and acquainting him with the general tenor of your orders, and with your views and intentions from time to time, so that the service may have the full benefit of your united efforts in the prosecution of such a service; and that in the event of any unavoidable separation, or of any accident

to yourself, Commander M'Clure may have the advantage of knowing up to the latest period all your ideas and designs relative to the satisfactory completion of this undertaking.

19. We also recommend that as frequent an exchange may take place as conveniently may be of the observations made in the two ships; that any information obtained by the one be as quickly as possible communicated for the advantage and guidance of the other.

20. In case of any irreparable accident happening to the *Enterprise*, you are hereby authorised to take the command of the *Investigator*, and to make such arrangements for the officers and crews as may be most consonant to the Rules of the Service, and most conducive to the objects of the Expedition.

* * * * * *

22. On your reaching England, you will call on every person, in both vessels, to deliver up to you all their logs, journals, charts, and drawings, but which, they may be informed, will be returned to them in due time.

23. With respect to your search proving fruitless, and your finally quitting the Polar Seas, as well as your securing your winter quarters towards the close of any one season, we cannot too strongly impress upon you the necessity of the utmost care and precaution being exercised in withdrawing in time; so as in no case to hazard the safety of the ships, and the lives of those entrusted to your care, by your being shut up in a position which might render a failure of provisions possible.

We feel it unnecessary to give you more detailed Instructions, which might possibly embarrass you in a service of this description; and we have therefore only to repeat our perfect reliance on your judgment and resolution, both in doing all that is possible to relieve the missing ships, and in withdrawing in time, when you come to the painful conclusion that your efforts are unavailing.

24. You will bear in mind that the object of the Expedition is to obtain intelligence, and to render assistance to Sir John Franklin and his companions, and not for the pur-

pose of geographical or scientific research; and we conclude these orders with an earnest hope that Providence may crown your efforts with success, and that they may be the means of dispelling the gloom and uncertainty which now prevail respecting the missing Expedition.

Given under our hands, this 15th day of January, 1850.

(Signed) F. T. BARING.
J. W. D. DUNDAS.

To RICHARD COLLINSON, Esq., C.B.,
Captain of Her Majesty's ship *Enterprise*
at Devonport.

By command of their Lordships.

(Signed) J. PARKER.

# PREVIOUS ARCTIC SERVICES

OF THE

## OFFICERS OF H.M.SS. ENTERPRISE AND INVESTIGATOR.

ENTERPRISE.

*Captain Collinson.*—A full record of his services will be found in the latter part of this book.

*Lieut. George A. Phayre.*—No previous service in the Arctic seas.
Retired as Captain, 1873.

*Lieut. John J. Barnard.*—With Capt. Sir Jas. Ross's expedition (1848), in *Investigator.*
Killed 1851.

*Lieut. Charles T. Jago.*—No previous service in Arctic seas.
Retired R. Admiral.

*Surgeon Robert Anderson.*—Served in *Investigator*, 1848.

*Mate, M. T. Parkes.*—No previous Arctic service; promoted Lieut. in *Enterprise*, 1851.

*Assist.-Surgeon Edw. Adams.*—Served in *Investigator*, 1848.

*2nd Master, Francis Skead.*—No previous Arctic service.
Now Harbour Master, Port Elizabeth.

*Clerk in Charge, Edward Whitehead.*—Served in *Enterprise*, 1848.
Died 1851.

INVESTIGATOR.

*Commander Robt. Le M. McClure.*—Commissioned Lieut. in 1837.
Served on the Canadian lakes, and in the West Indies.
1st Lieut. of *Enterprise*, 1848.
Promoted Captain, Oct. 26, 1850 (on discovery of N.W. Passage).
Knighted in 1854; gold medal Royal Geographical Society.
Served in China 1856–61.—Made C.B.—Died, Oct. 1873.

*Lieut. William H. Haswell.*—No previous Arctic service.
Retired V. Admiral.

*Lieut. Samuel G. Creswell.*—Served in *Investigator*, 1848, as Mate.

*Surgeon Alex. Armstrong, M.D.*—No previous Arctic service.
Subsequently K.C.B., LL.D., F.R.S., and Director Genl. Med. Dept.
Retired 1880.

*Mate, H. H. Sainsbury.*—Died 1853.

*Mate, Robt. J. Wynniatt.*—Served in *Sulphur* (Capt. Belcher), 1843–7.

*2nd Master, Stephen Court.*—Served in *Enterprise*, 1848.
Subsequently Harbour Master, Shanghai.

*Assist.-Surgeon H. Piers.*

*Clerk in Charge, J. C. Paine.*

## LIST OF OFFICERS.

*H.M.S. Enterprise.*

| Date of Appointment. | Name. | Rank. | |
|---|---|---|---|
| December 14th, 1849 . . | Richard Collinson . . | Captain. | |
| „ „ „ . . | G. A. Phayre . . . . | Lieutenant. | |
| „ „ „ . . | J. J. Bernard . . . . | Do. . . | Killed by the Indians at Dwrabbin (Nulato) in Feb. [1851. |
| January 3rd, 1850 . . | C. T. Jago . . . . | Do. | |
| December 19th, 1849 . . | R. T. Legg . . . . | Mate . . . | D. at Honolulu, June 30th, 1850. |
| January 5th, 1850 . . | M. T. Parks . . . . | Mate . . . | February 17th, 1851, Acting Lieutenant. |
| December 14th, 1849 . . | F. Skead . . . . . | Second Master. | |
| January 9th, 1850 . . | J. Atkinson . . . . | Ice Mate. | |
| „ 13th, 1850 . . | G. Arbuthnot . . . | Do. | |
| November 7th, 1854 . . | W. N. Wise . . . . | Acting Mate. | |
| December 14th, 1849 . . | Robert Anderson . . . | Surgeon. | |
| „ „ „ . . | Ed. Adams . . . . | Ass. do. | |
| November 6th, 1854 . . | J. T. Turner . . . . | Clerk in charge | Died November 28th, 1854. |
| December 14th, 1849 . . | Ed. Whitehead . . . | Clerk in charge | Died June 19th, 1851. |
| „ 26th, „ . . | Jas. Woodward . . . | Boatswain. | |
| „ 29th, „ . . | Wm. Waldron . . . | Carpenter. | |

# LIST OF SHIP'S COMPANY.

*H.M.S. Enterprise.*

| Date of Entry. | Name. | Rating. | Age. | |
|---|---|---|---|---|
| Dec. 17th, 1849 | Thos. Bugbee . . | Blacksmith . . | 30 | |
| „ „ „ | Wm. Driver . . | Ship's Cook . . | 48 | Died May 14th, 1852. |
| „ 18th, „ | Josh. Page . . | Gunner's Mate . | 28 | June 28th, 1854, Seaman Gunner. February 1st, 1855, Gunner's Mate. |
| „ 19th, „ | Hy. Hester . . | Captain's Coxswain | 23 | D. February 16th, 1855. |
| „ 20th, „ | Chrn. Jacobson . | A.B. . . . . | 25 | R. March 19th, 1851. |
| „ 22nd, „ | Chas. Elmore . . | Captain of M.T. A.B. July 3rd, 1850 | 28 | Captain of the Hold, February 21st, 1855. |
| „ „ „ | Wm. Gowen . . | Captain of F.T. A.B. May 7th, 1850 | 27 | Captain of M. Top, January 19th, 1855. |
| „ „ „ | Wm. Luxford . | Quartermaster . | 29 | D. D. December 30th, 1850. |
| „ „ „ | Jas. Rich . . . | A.B. . . . . | 26 | May 7th, 1850, Captain of F.T.; April 23rd, 1851, Boatswain's Mate. |
| „ „ „ | Hy. Forder . . | Captain of Hold . | 26 | February 20th, A.B. |
| „ „ „ | Saml. Belither . | A.B. . . . . | 21 | |
| „ „ „ | Lewis Carroll . | A.B. . . . . | 30 | July 3rd, 1850, Captain of Forecastle. |
| „ „ „ | Hy. Sargent . . | A.B. . . . . | 22 | |
| „ „ „ | Robt. Grant . . | A.B. . . . . | 20 | R. March 19th, 1851. |
| „ „ „ | Jno. McLaskey . | A.B. . . . . | 27 | April 1st, 1850, Boatswain's Mate. R. April 1st, 1851. |
| „ „ „ | Thos. Naylor . . | Captain of Forecastle | 37 | July 3rd, 1850, A.B. R. April 1st, 1851. |
| „ 23rd, „ | Wm. Scott . . | Officers' Cook . . | 25 | |
| „ „ „ | Vincent Bulkeley | Captain's Steward. | 24 | D. November 15th, 1854. |
| „ 24th, „ | Wm. Murray . . | A.B. . . . . | 25 | |
| „ 26th, „ | Jno. Nutcher . . | A.B. . . . | 23 | April 23rd, 1851, Captain of F. Top; December 19th, 1854, A.B.; D. February 16th, 1855. |

## LIST OF SHIP'S COMPANY—*continued.*

| Date of Entry. | Name. | Rating. | Age. | |
|---|---|---|---|---|
| Dec. 26th, 1849 | J. E. Davidson . | A.B. . . . . | 23 | D. D. January 16th, 1855. |
| „ „ „ | Wm. Marshall . | A.B. . . . . | 23 | December 10th, 1854, Quartermaster; February 17th, 1855, Captain's Coxswain. |
| „ „ „ | Jas. Davidge . . | A.B. . . . . | 22 | |
| „ „ „ | Jno. Wenman . | Carpenter's Crew . | 27 | |
| „ „ „ | Rd. Shingleton . | Gunroom Steward | 34 | |
| „ 27th, „ | Chas. Harris . . | A.B. . . . . | 26 | June 28th, 1850, invalided. |
| „ 28th, „ | Rodger Reid . . | Quartermaster, Capt. of Forecastle | 36 | April 10th, 1850, invalided. |
| „ „ „ | Rd. Thomas . . | A.B. . . . . | 24 | May 14th, Ship's Cook; October 15th, 1853, A.B.; June 29th, 1854, Ship's Cook. |
| „ „ „ | Jas. Edmunds . | A.B. . . . . | 25 | R. January 17th, 1850. |
| „ „ „ | Wm. French . . | A.B. . . . . | 23 | |
| „ „ „ | Jno. Elsey . . | Boatswain's Mate | 40 | Discharged with disgrace, January 9th, 1850. |
| „ „ „ | Hy. Selby . . . | A.B. . . . . | 33 | July 3rd, 1850, Quartermaster. |
| „ „ „ | Wm. Smith . . | Purser's Steward . | 28 | |
| „ 29th, „ | Jno. Charters . . | A.B. . . . . | 27 | February 17th, 1855, Captain of F. Top |
| „ „ „ | Wm. Worchurst . | Carpenter's Crew . | 22 | R. March 19th, 1851. |
| „ „ „ | Geo. Fowler . . | Quartermaster . | 29 | |
| „ „ „ | Jno. Murphy . . | Carpenter's Mate . | 31 | R. April 1st, 1851. |
| Jan. 2nd, 1850 | Geo. Johnson . . | Caulker . . . | 25 | D. February 16th, 1855. |
| „ 4th, „ | Arthur Dickens . | Boatswain's Mate . | 31 | April 1st, 1850, A.B.; D. April 19th, 1850. |
| „ „ „ | Wm. Hutchenson | A.B. . . . . | 25 | Invalided April 10th, 1850. |
| „ „ „ | Timy. Horn . . | A.B. . . . . | 26 | R. April 1st, 1851. |
| „ „ „ | Wm. Jefferson . | A.B. . . . . | 26 | December 20th, 1854, Capt. of F. Top; D. February 17th, 1855. |
| „ „ „ | Chas. Leggatt . . | Boatswain's Mate . | 44 | D. June 29th, 1850. |
| „ 16th, „ | Thos. Cousins . | A.B. . . . . | 26 | October 13th, 1850, Captain of M. Top. |

| | | | | |
|---|---|---|---|---|
| Jan. 17th, 1850 | G. M. T. Bosquet | A.B. | 24 | |
| „ 18th, „ | Jno. Elliot | A.B. | 22 | R. June 29th, 1850. |
| „ 19th, „ | Jos. Wood | Sailmaker | 46 | |
| April 20th, „ | Geo. Burns | A.B. | 23 | |
| June 29th, „ | Richd. Young | A.B. | 30 | R. January 1st, 1851. |
| „ 30th, „ | Jno. Carstairs | Boatswain's Mate | 31 | March 5th, 1855, A.B. |
| Feb. 17th, 1851 | Phas. Kimble | A.B. | 29 | |
| „ „ „ | Alfd. Ball | A.B. | 24 | |
| „ 19th, „ | Watson Wilson | A.B. | 24 | |
| March 4th, „ | Wm. Smith | Quartermaster | 31 | October 17th, 1852, A.B.; April 1st, 1853, Captain of M. Top; January 8th, A.B. |
| „ „ „ | Wm. Littlefield | A.B. | 23 | |
| April 1st, „ | Thos. O'Bryan | A.B. | 30 | |
| „ „ „ | Wm. Cooper | A.B. | 30 | |
| „ „ „ | Jos. Wiggins | A.B. | 25 | D. D. March 4th, 1855. |
| „ „ „ | Saml. Perkins | Carpenter's Mate | 34 | D. November 15th, 1854. |
| „ 2nd, „ | Wm. Greenaway | A.B. | 40 | Died November 4th, 1853. |
| „ „ „ | Wm. Simpkins | A.B. | 27 | D. D. January 2nd, 1855. |
| Feb. 19th, 1855 | W. W. Davis | | | |

MARINES.

| | | | | |
|---|---|---|---|---|
| Dec. 22nd, 1849 | Isaac Jeffrey | Sergeant | 32 | |
| „ „ „ | Jas. Moss | Bombardier | 26 | D. April 19th, 1850. |
| April 22nd, 1850 | Rd. Hill | Corporal | 36 | |
| Dec. 22nd, 1849 | Wm. Woodhead | P. 3rd class | 32 | |
| „ „ „ | Tho. Bratt | Do. | 28 | |
| „ „ „ | Geo. Deverell | Do. | 29 | |
| „ „ „ | Jas. Adams | Do. | 30 | Invalided July 9th, 1851. |
| „ „ „ | Jas. Mayers | Do. | 30 | |
| „ „ „ | Jno. Eyre | Do. | 35 | Invalided June 28th, 1850. |
| June 29th, 1851 | Wm. Cheeseman | Do. | 35 | Died June 29th, 1853. |

# COMMENCEMENT OF JOURNAL.

## SECTION I.

### England to Magellan Straits.

I received my appointment to the command of the expedition about to proceed to Behring Strait in search of the *Erebus* and *Terror* on the 14th of December, 1849, and on going to Woolwich the same day, I found the two ships which were intended for the purpose in dock, being coppered. Having hoisted the pennant on board the *Enterprise*, a party of riggers commenced getting the tops, caps, and lower rigging over the mast-head, while a gang of convicts were employed to clear the holds of stone ballast. The ships having recently returned from Lancaster Sound, their fittings were complete, and but few alterations required for our passage through the tropics; and with the active co-operation of all the authorities, our equipment made great progress, it being necessary to get to sea as early as possible in order to save the season. On the 18th, Commander M'Clure took the command of our consort, the *Investigator*. On New Year's Day we hauled out into the river, and upon the 10th were towed down to Greenhithe, and inspected by the Lords of the Admiralty.

Although I had anticipated being able to sail within a month of the date of the ships being put into commission, yet I must acknowledge it could not have been done without the cordial assistance I received, not only from the officers in the Dockyard, but those in charge of the Royal Arsenal and the Victualling Departments. Captain Austin (under whom I have had the pleasure of sailing in three ships) was, during the temporary absence of Commodore Eden, in charge of the

Dockyard, which enabled me to receive the benefit of his advice and experience, and add a load to the many obligations I am under to him. At the Arsenal the armament of the vessels was reduced to a light and a heavy brass 12-pounder, which, with some rockets and shrapnell shells, would, I thought, prove an ample defence. Colonel Colquhoun equipped a light cart for us, and made some experiments on the effect of steam upon ice. In the Victualling Department, the orders of the Admiralty were speedily attended to, and the whole of the salt meat for the use of the expedition was corned and packed in Deptford Yard subsequent to the 20th of December. The ships on the previous voyage having suffered from scurvy, owing, it was supposed, in some measure to the lime-juice, all of that essential article to an Arctic voyage was prepared under Sir Wm. Burnett's care for our use; and fresh pemmican was prepared for us by Sir J. Richardson at Portsmouth. In fact, the anxiety of all parties to forward our endeavours was manifest, and showed what a deep interest was taken in the fate of our missing countrymen. And in none more so than by the Board of Admiralty, who, with an unsparing and liberal hand, contributed everything that was needful for our comfort, as well as for our efficiency.[1]

[1] FITTING OUT.—The *Enterprise* and the *Investigator* were both purchased expressly for the expedition of 1848 under Captain Sir James Ross, the first of the "Search" expeditions; the *Investigator* being then just built. The tonnages given in the 'Nautical Magazine' are *Enterprise* about 380, *Investigator* 340. Allen's 'Navy List,' 1850, gives *Enterprise* 530 tons, *Investigator* 480 tons, no doubt their full weight. Dr. Armstrong, in his appendix, gives a full description of the work done to strengthen the ships for the ice, but being in shipwright's English it conveys no intelligible ideas to the ordinary reader. To an ignorant landsman it appears to signify that on the outside of the vessels additional planking was fixed, 7 inches thick above, and 3 inches below water; and inside, the decks were strengthened with two layers of 1½-inch boards, crossing diagonally; the bow and stern were pretty well filled up with wood and iron castings (radiating inwards) forming, says Osborn, veritable solid caissons; the bulkheads were stiffened with two additional layers of 1½-inch boards, laid diagonally; the pillars supporting the decks were tied together and to the decks with T iron and bolts; and the upper deck had an extra 3-inch plank over it, laid diagonally: the ships' sides were felted and covered with ¾-inch boards.

Arrangements for heating and ventilating were also provided. Sylvester's stoves, with hot-air pipes, enclosed in an outer casing, to convey the warm air throughout the ship; and copper tubes, also enclosed in casing, to carry the foul air to the upper deck. These, although complained of by Sir E. Belcher, appear to have answered fairly well in these two ships; but they did not remedy that general and serious defect of condensed moisture in the lower decks, which greatly affected the crew of the *Investigator*.

The strengthening of Her Majesty's ships for this service seems to have been so far satisfactory, that they all stood an extent of crushing and grinding and lifting such as no whaler could exist under; but as to being proof against a nip of Polar ice, Arctic voyagers laugh at the idea, and some think the strengthening may be carried too far, because a lighter vessel will rise to the pressure.

"The remark made by an old seaman who had grown grey amongst the ice, was often recalled to my mind as, with an aching heart, for many a mile I dragged the clumsy *Resolute* about: 'Lord, Sir! you would think by the quantity of wood they are putting into *them* ships, that the dock-yard maties believed they could stop the Almighty from moving the floes in Baffin Bay; every pound of African wood they put into them the less likely they are to rise to pressure; and you must, in the ice, either rise or sink. If the floe cannot pass through the ship it will go over it.'" (Osborn, 'Arctic Journal.')

Such criticisms, however, really belong to a past era, for steam vessels have now superseded sailing ships, even in Arctic seas. And though a steamer requires strengthening for such service, she has the power of evading or driving through danger that no sailing ship possesses. Osborn (in 'Arctic Journal') contrasts, in his dashing style, the battering-ram action of a bluff-bowed sailer charging a floe, with the incisive force of a sharp-bowed steamer coming straight on and cutting through it with a good momentum; and Belcher says decisively, that all ice-going ships should be steamers. Indeed, it requires very little reading of Arctic voyaging in those days to perceive that a vast amount of time and a large quantity of labour and expense would have been saved if steamers had been sent in every case.

Another evil arising from the absence of predetermination in the matter of the Search, was the haste in which the vessels had to be prepared. Sir James Ross's expedition returned in November, 1849, and the two vessels of it sailed again for Behring Strait in January, 1850; within that time officers and crews had to be selected and got together, and all the arrangements for provisioning, clothing, travelling, scientific observing, and communicating had to be made under the responsibility of those officers while the fitting of the ships was going on. When we find that they had to put into Plymouth to take on board the most important part of their provisions, we can hardly be surprised to hear that three years afterwards, when at the extreme point of their Arctic voyaging, they found their stock of coal eighteen tons short of what should have been put on board, and were

thus driven to return. And we can appreciate the confusion, and even alarm, at the overladen condition and crowded state of the decks, filled with sledges, ice saws, and cumbrous apparatus, when they finally went to sea.

At the same time, Captain Collinson (and also Commander M'Clure) speaks warmly of the zeal and energy and kind attention of the officers of Woolwich Dockyard. Sir E. Belcher also records his gratitude for their services to his expedition.

The officers and crew of this expedition received *double the ordinary pay* from the time of passing the meridian of Cape Horn. Those employed in the Eastern expeditions received it from the date of sailing.

The Colonel Colquhoun mentioned in the Journal was the officer of the Royal Artillery in charge of the Carriage Department in the Royal Arsenal at Woolwich at that time. He was distinguished for his practical science, and had made a voyage to the Arctic seas for the purpose of trying experiments with harpoons fired out of guns. There is no record of his experiments with steam upon ice.

*Provisions and Clothes.*—Both Captain Collinson and Commander M'Clure bear testimony to the excellence of the provisions of all kinds supplied by the Admiralty to this expedition; to which they both attributed, in a great measure, the preservation of their crew's health. Sir E. Belcher speaks in the same terms, and in the appendix to his account of his expedition of 1852–4, makes observations on the various kinds of provisions and clothes supplied to it, which will be useful to future navigators in Arctic or Antarctic seas. The following are some of the most important:—

Biscuit, good and valuable (Captain Nares found in 1876 that the biscuit left by the American ship *Polaris* N. of Smith's Sound (lat. 82°) in 1872 was quite good).

Corned beef, good.

Corned pork, too salt.

Bacon, too fat.

Split peas, very good.

Chocolate (paste and sweet), excellent, very important to travelling parties.

Essence coffee, good, and useful when wet.

Cranberries, very good and beneficial.

Dried cabbage, excellent, much liked.

Dried potatoes, excellent, not much liked.

Macaroni, better than potatoes.

Preserved meat, too much cooked.

Portable soups, very valuable.

Pemmican, with currants and herbs preferred.

Onion powder, excellent, much liked.

Curry powder, good.

Cayenne pepper, very good for travelling parties.

Chillies, very good for travelling parties.

Strong mustard, very good for travelling parties.

Burton ale, very good and very important.

Essence malt and hops, invaluable. (They brewed a good supply of very fair beer on board.)

Lieutenant Payer (Austrian Expedition) enforces the importance of supplying fresh bread, even though it should be unleavened. And he considers wine, beer, and spirits as useful auxiliaries.

*Clothes generally*, supplied by the Admiralty, not very satisfactory; not good enough material, and badly made.

Lieutenant Payer recommends *down*-quilted clothes as valuable articles in hot and cold weather.

(See note on "Health" for further remarks.)—[ED.]

At Greenhithe, the necessary observations were made to ascertain the deviation of the compasses, and being taken in tow by the *African*, we passed through the Downs on the 13th of January, 1850, and after experiencing some bad weather in the Channel, anchored in Plymouth Sound on the 16th, where we were compelled to put in to receive the greater portion of our preserved meats, which had not arrived from Dublin.

Mr. Gamble came with these on the 18th of January, and we put to sea with a fair wind on the morning of the 20th, which, however, did not favour us long. We soon found that in point of sailing, we had the advantage over our consort; and in carrying sail to keep company she carried away her fore-topmast. Then, thinking that in light winds she might have the advantage, I determined on not delaying our progress by keeping company. We fell in with one another again on the 31st of January, and parted again on the following day. The equator was crossed in longitude 28° W. on the 5th of March by us, the *Investigator* crossing it on the same meridian within twenty-four hours. In fact, the two vessels were never two days' sail apart until the 31st of March, when we obtained an advantage by standing to the southward with a south-westerly wind, while Commander M'Clure, being desirous to hug the coast, stood to the N.W., and this brought us to the entrance of the Straits of Magellan eight days before him.

The monotony of the voyage was in some measure relieved by the magnetical observations, but I found it nearly impossible to obtain a satisfactory result for the force with Fox's instrument, by means of the weights, and therefore substituted, as a second deflector, one of the spare needles.

We were also supplied with a small apparatus, invented by Colonel Sabine, for ascertaining the changing part of the deviation on account of the ship's iron. It, however, so seldom happens that you can keep the ship's head steady on the two resultant points, that unless in a steam vessel, or by using a large spar to swing the ship by, it can only be used with the wind at eight points of the compass, as in putting the helm down to go about the ship does not remain sufficiently long with her head at the point required to obtain a satisfactory observation. I have found also that it is necessary that the ship should remain in the required direction a considerable period before the effect of the ship's iron obtains its full influence on the compass; and therefore think the deviation will in most cases be obtained with greater satisfaction by the bearing of a distant object, as the ship swings at her anchor, and her head has remained steady in the same direction for an hour or more, than by turning the ship rapidly by means of warps.

We were also supplied by M. Regnault with a number of glass tubes for bottling off air and hermetically sealing it, in order that its composition in different parts of the globe may be ascertained. These are to be filled on the 1st and 15th of each month, or on such occasions as may appear sufficiently remarkable. One accordingly was filled on the 1st of March, when we were in a central position in the Atlantic, and one at each end of the Straits of Magellan. An account of our daily progress will be found in the following pages, and the currents, or difference between observation and reckoning, arranged in zones according to their effort.[2]

[2] Scientific Apparatus.—In addition to what we may call the official preparations for these Arctic expeditions, there were always extraneous subjects to be thought of by the commanding officers; special observations proposed by scientific societies, or by persons interested in particular points connected with Polar regions, or inventors of apparatus supposed to be of high value for the purpose. And among these, in the case of this expedition, were the following:—

*Magnetic Observations.*—These, undertaken mainly at the instance of the Royal Society, formed a regular part of every Arctic expedition at the time, and various instruments for measuring the declination and dip of

the magnetic needle, and the force of electric currents, were put on board the *Enterprise*. They formed part of an extensive and long-continued series of such observations made by the surveying vessels of the Royal Navy, for some had been made by Captain Collinson himself when a midshipman on board the *Chanticleer*, under Captain Forster, in 1828–30. They were all put into the hands of the well-known physicist, General Sabine, Royal Artillery, and abstracted and collated by him, and published in the 'Philosophical Transactions of the Royal Society.' Those taken by Captain Collinson during this voyage will be found in General Sabine's papers on "Terrestrial Magnetism," No. xiii. (1872) and No. xiv. (1875); and an abstract of Arctic magnetic observations is given in the 'Arctic Manual,' 1875.

*Bottles of Air.*—M. Victor Regnault, late Professor of Physics in the Polytechnic School, Paris, had been for some years making researches into the composition of atmospheric air in different parts of the globe. Captain Parry carried with him in his second voyage, 1821–2 (to Hudson Straits), some tubes, and filled them with air during his voyage: these were analysed by Mr. Faraday at the Royal Institution. Captain Sir James Ross, in his "Search" voyage of 1848–9, was supplied by M. Regnault with tubes, and took twenty-eight samples of air in the course of it, of which seventeen were examined by M. Regnault. That gentleman also supplied the *Enterprise* with some tubes, and Captain Collinson records in a private note-book taking twenty samples of air during the expedition; but there is no record of what was done with those taken on his return home. M. Regnault is now dead, but thanks to Mr. Scott of the Meteorological Office, who communicated with his successor in Paris, I was able to refer in the library of the Royal Society to the 'Annales de Chimie et de Physique,' where, in Vol. 36 (1852), p. 385, are to be found some of the results of his researches. Although these do not include the samples taken by the *Enterprise*, they appear to contain Mr. Regnault's final observations on this subject. His object was to examine the composition of air taken from various parts of the world, and hermetically sealed in glass tubes, and all subject to the same analysis in Paris. The tubes were about 10 inches long and 2 inches diameter, and drawn to a fine opening at each end; when used, a pair of bellows is applied with an india-rubber tube to one end, and drives out the air in it, replacing it with the air of the place. The fine ends are then held over a spirit lamp until the glass is soft enough to be drawn out so as to seal up the opening. The air was to be taken on the 1st and 15th of each month at noon of the place.

The samples examined by M. Regnault were from Berlin, Madrid, Switzerland, Mediterranean, Atlantic, Indian Ocean, and Arctic Sea, besides Paris; and the general conclusion he appears to have arrived at, was that the composition of the atmosphere varies but little all over the world, judging by the proportion of oxygen (which alone he concerned himself with), as the extreme variations of oxygen were from 20·9 to 21 parts per cent. of the volume of air. The samples taken by Sir James

Ross (Baffin Bay and Lancaster Sound) varied from 20·86 to 20·93 per cent. of oxygen. This, however, does not agree with the record of those taken by Captain Parry and examined by Mr. Faraday, which are stated to have given 20·5885 per cent. of oxygen.—*Arctic Manual.*

*Diet and Work.*—Sir Lyon Playfair, who is well known for his researches into the question of the "Food of Man as compared with the Work he does," as well as for his various other public services, asked Captain Collinson to make some careful observations on this subject in the course of his Arctic work. And as seamen in the course of such service go through some very hard work in sledge-drawing, in very low temperatures, any such records carefully made, would have added something to the knowledge of man's power of work under different conditions. But Sir Lyon Playfair informs me that he has no record of any observations taken by Captain Collinson; and, therefore, the opportunity has gone of having this experience carefully examined by that eminent enquirer. In his Journal, however, Captain Collinson has recorded some full and useful statements connected with his sledge expeditions; and these have been collected into a note, together with extracts from the records of other remarkable sledge expeditions during that period, which will give, perhaps, as much information on the subject of diet, loads, and journeys as is practicable to obtain now.

*Postal Balloons.*—Mr. G. Shepherd (26, Fleet Street) appears to have been the suggester or constructor of some small balloons which were used during these Arctic voyages for the purpose of scattering notices about the Arctic regions. A note about them will be found in the body of the Journal.

*Use of Gunpowder in Ice.*—Admiral Sir L. M'Clintock has very kindly allowed me to make use of a memorandum on this subject, which he compiled a few years ago, which will be found in Note 36.

*Mustard and Cress.*—The provision of seed for the growth of these useful little vegetables was one of the many subjects which have to be dealt with by the commander of an Arctic expedition. In this case the produce does not appear to have been very successful; but in Sir E. Belcher's expedition of 1852–4 that ingenious officer tried experiments with soil collected from the shore, and got very good results, to the benefit of his sick bay.

*Apparatus for Breaking up Ice.*—A sort of pile-driving apparatus was supplied for the object of cracking the ice, but there is no record of its useful application.

*Record of Progress and Meteorological Observations.*—A very complete record of the progress and meteorological observations is in the original Journal of the *Enterprise* voyage; but it has not been thought necessary to publish them in this book, because they are voluminous and only of value to the students of that unmanageable science, and they will find the most important part of them, as far as science is concerned, in the 'Contributions to the Knowledge of the Meteorology of the Arctic Regions,' published by the Meteorological Office in 1882.

The records in the original Journal consist of tables, in which is given, in the Commander's own hand, for every single day of the whole voyage of five years, the following data:—1. The barometric pressure. 2. The temperature of the air (maximum, minimum, and mean), and of the sea, and of the cabin at certain times. 3. The direction and force of the wind. 4. The weather, by which colloquial term the scientist signifies the state of the atmosphere. 5. The latitude and longitude of the ship, both by observation and by account (which last word signifies "the dead reckoning," which again signifies, for some abstruse nautical reason, the position of the ship calculated by the log and compass). There is also added from time to time notices of particular occurrences or observations, such as "thickness of ice, temperature in special positions, appearances of the Aurora."

There are also given occasionally abstracts of these observations, and of the course of the voyage during each month, and of the currents of the sea passed over, and of the game killed.

The records (extracted from the Journal, and from other sources) given in the 'Contributions' published by the Meteorological Office, are the observations taken while at anchor during each winter in Walker Bay, Cambridge Bay, and Camden Bay; and are arranged and collated and abstracted for scientific use by the officers of that department.—(ED.)

At 7.20 a.m., April 6th, we got sight of the high land in the neighbourhood of Cape de los Desvelos, and by noon were abreast of Port S. Julian, about eighteen miles from the shore. Some of those curious birds (the genus Chionis) alighted aloft and were shot. In the afternoon the wind freshened from the northward, affording us a good run of 170 miles by noon. The land to the north of Cape Virgins was seen at 10 a.m., April 7th, and we were in hopes of doubling that cape by nightfall; in this, however, we were disappointed by the wind drawing round to the westward with a falling barometer and every indication of a gale. It came on with a violent squall at 1 p.m., on which we hauled to the north, keeping in comparatively smooth water under the lee of the land. About 6 it cleared off, and we again bore up for the Cape, but were glad to haul off again in time to prevent our being caught among the shoals off it, in the squally and thick weather that ensued during the night, and reduced us to close-reefed main topsail.

At 9.15 a.m., April 8th, the breeze having abated, we made sail and got sight of the land again by 10. In the afternoon it became moderate, and we got hold of the Cape, bearing

S.W. by W. half an hour after midnight, and at 2.15 a.m., April 9th, passed over the edge of the Sarmiento bank in 9 fathoms. During the day we continued to work to the westward against a heavy swell which occasioned the vessel to miss stays once or twice, and at 10.15 p.m. I brought up in 20 fathoms with Cape Possession, bearing W.N.W. two miles.

Weighing with the flood at 5 a.m., April 10th, at 8 we had the satisfaction to exchange numbers with the *Gorgon* at anchor in Possession Bay. In working up to her anchorage (which was off the south end of the shoals that dry at low water), we stood into the bottom of the bay, the east head of which appears to be free from danger. At 12.15 we came to, and I found from Captain Paynter that a schooner anchored near to him, was the *Nancy Dawson*, which vessel, under the command of her owner, Mr. Shedden, had accompanied the *Herald* and *Plover* in the Arctic cruise of last year. Mr. Shedden, it appeared, had died at Mazatlan, and Captain Kellett had placed Mr. Hill (the master of the *Herald*, who, in consequence of ill-health, could not have returned to the Arctic regions) in charge of the yacht, and from this gentleman I got an account of all their proceedings, as well as a great deal of useful information, and some charts. Captain Paynter had, it appeared, persuaded him to remain another twenty-four hours for the chance of seeing us.

From Captain Paynter I found that the *Gorgon* had been twenty days in the straits, during which period he had remained principally at his present anchorage, having quitted it only on two occasions, one of which was to obtain fresh water, the streams in Possession Bay being dry, and there being a convenient spot in St. Iago Bay between the first and second narrows for this purpose: on the second occasion they went to the rescue of the crew and passengers of an American schooner (amongst whom were two ladies) that was wrecked upon Point Barranca, the straits having become in some measure a highway for the emigration to California; we heard, however, of some vessels having been detained in them upwards of seventy days without succeeding in effecting the passage, and that nearly all suffered loss

of anchors and cables or damage to their rigging and sails from the violent squalls.

Captain Paynter gave so favourable an account of the first narrows, that he had shot them twice under canvas in the *Gorgon*, that instead of taking him on as I had arranged with Commander M'Clure, I determined upon leaving the *Gorgon* here to bring on our consort, and push forward alone. Our voyage having been protracted ten days longer than I anticipated, and it being necessary to calculate that some further delay would be occasioned by the non-arrival of the *Investigator*, it became an object of consultation whether by putting into Valparaiso we might not lose the season this year to the North; I in the end made up my mind to go on straight to the Sandwich Islands, and understanding from Captain Paynter that the Chilian settlement had been removed from Port Famine to Sandy Point, I determined on calling there and procuring such supplies as would prevent the appearance of scurvy, which might be anticipated unless we obtained some change in diet; this and the completion of our water would detain us, but I hoped to accomplish both previous to the arrival of the *Investigator*. We, therefore, commenced immediately to take from the *Gorgon* all the provisions except what were necessary for her return to Valparaiso, and which would lessen the expense of our completion at the Sandwich Islands.

## MAGELLAN STRAITS.

Having done this, we started with the first of the flood at 5 the next morning (April 11th) with the wind from the westward, that throughout the day proved light; by aid of tide, however, we got to an anchorage in St. Phillip's Bay, fourteen miles beyond the narrows. Captain King's directions and charts answered their purpose admirably; the only difficulty we experienced was in making the land about Cape Orange, mistaking at first the peak in the interior for the cape at the south side of the entrance; as the rapid tide carried us through the narrow part of the channel, which is

twelve miles long, we had a good view of several herds of guanacoe, and one or two ostriches showed themselves for our gratification; on Point Barranca was the wreck of the schooner, the crew of which had been taken off by the *Gorgon*. When abreast of the point, having accomplished the most difficult part of our task, the wind totally failed us, and the tide began to slacken, so that I somewhat feared we should be carried back by the ebb, there being no anchoring ground. Providentially the sea-breeze came in to our aid, to which we spread all our canvas, and, greatly to my satisfaction, attained soundings before the ebb made too strong for us to overrun it, which it did at 3.40 p.m. The flood made at 7, but such was the thick and hazy state of the weather, that it was not prudent to attempt the second narrows in the night tide, we therefore remained until 6 a.m. April 12th, when the tide slackening, we weighed with a N.W. wind, and reached Cape Gregory and shot through the second narrows in a calm, reaching the north end of Elizabeth Island by 2.30 p.m.; here the tide failed us, but by dint of towing we reached an anchorage in 15 fathoms with the Santa Martha Island bearing S. 41 E., and the Foreland Point N. 55 E.

There being no wind and hazy weather, we remained here until 7 the next morning (April 13th), when weighing with a north-westerly wind, we worked down between Elizabeth Island and Wallis Shoal; with the south end of the former bearing N. 76 E. 3 miles we tacked on a shoal patch, the least depth of water being $6\frac{3}{4}$ fathoms; but I have little doubt there is less. At 2 p.m. we rounded Sandy Point, and saw the Chilian colours flying at the settlement; sending a boat to keep us off the shoal which extends from the Point into the bottom of the bay, we tacked in 5 fathoms (putting the helm down in 8) $\frac{3}{4}$ of a mile from the beach opposite to the settlement, and anchored in 9 fathoms; the high-water mark of Sandy Point bearing N. 5 E. Point St. Mary S. 10 E., and the Chilian Flagstaff N. 83 W.

Seeing several cattle among the trees, we made no doubt of getting our wants supplied, but on going on shore I found,

to my great concern, that particular directions had been given by the Chilian Government for the preservation of the cattle. By dint, however, of much persuasion, pointing out the peculiar position in which we were situated, and promising to write a letter to the British Minister at Valparaiso, the Governor kindly consented to let us have four bullocks.

The settlement is a penal one, and but yet in its infancy, this being the second year of their removal from Port Famine; most of the houses were mere ranches, but that of the Governor and one or two others were comfortable residences. Some fear of the Patagonians, or the necessity of keeping the convicts in awe, had induced him to surround it with stockades; the latter appeared much at their ease, a few only working in fetters. The Governor, with a very good intention, offered their assistance in filling our water-casks; this, however, was not found necessary, owing to that excellent contrivance "Gossage's Pump." The country in this vicinity being more open, affords better pasturage for the cattle than that about Port Famine; and they have the advantage of a better communication with the Patagonians. Several females belonging to that race were domiciled among the residents; and were chiefly remarkable by the largeness of their heads and breadth of countenance. The anchorage, however, is no more than a roadstead, and with southerly winds at all fresh communication with the shore must be cut off. By the Governor's account, however, there is a good vein of coal within nine miles of the settlement, which is likely to prove very profitable, as by the aid of steam the strait will, I have little doubt, supersede the stormy passage round Cape Horn. Several pieces of lignite were picked up, and there was a good supply of firewood in readiness for any vessel that might require it, but their means of transport are yet in a deplorable condition, and it can only be said that they are in the first stage of wheeled vehicles.

*April 14th.*—We hauled our seine to some advantage, and (having embarked two live bullocks and the carcases of two more, out of which the Governor had taken a tithe, and

which, considering they were not permitted to kill on their own account, I could not object to, but ought to have embarked them all alive), we weighed at half an hour after noon, running along the land with a northerly wind, and reaching Point St. Isidro by midnight.

At 4.20 a.m., April 15th, on opening the reach west of Cape Froward, the wind headed us off in a squall and reduced us at once to double-reefed topsails; standing over to the south shore, we found ourselves when day broke off the islets forming Port St. Antonio; after making several tacks and finding we gained little or nothing, I determined on putting into San Nicholas Bay, believing that we should be better employed completing our water instead of beating about; we accordingly bore up at 11.30, and came to at 1.30 p.m. in 10 fathoms under Nodales Peak, on the west side of the bay; here we found a convenient stream for our purpose and got a fair supply of fish with our seine at the mouth of the De Gennes River. This bay appears to be a favourite stopping place, as we found the names of several vessels on the trees, which with the underbush formed an almost impenetrable jungle down to high-water mark.

### Junction with 'Investigator.'

*April 16th.*—The morning proving fine, we weighed at 5.30, and got within two miles of Cape Froward by noon. This cape rises very abruptly from the sea to the height of 2500 feet, and forms a bold termination to the continent; at its base is a small peaked rock, which we looked at with some interest, not without hopes that it might be our fortune in like manner to double the north end, and thus circumnavigate America. The land of Tierra del Fuego rises in very abrupt peaks, and at one time we caught sight of Mount Sarmiento towering above the clouds. The wind was very light, but slow progress made owing to a contrary current, the regular ebb and flow entirely ceasing here, and giving place to a continual indraft from the Pacific, and it is from this point that the main difficulties occur to vessels bound

westerly. By nightfall we had Snug Bay under our lee, and consequently would not be compelled to fall back upon our late anchorage in the event of a gale; at 9 p.m. we passed Cape Holland, the weather being hazy with light variable winds.

*April 17th.*—At 4 a.m. Cape Gallant bore W.N.W., and at daylight we found a ship and two schooners standing out of Fortescue Bay; at 8.30 the wind proving light, and it being evident that the vessels which had now reached the opposite side of the straits were losing ground, I determined to hold what we had got, and accordingly towed into Fortescue Bay, where we anchored in 14 fathoms. In the afternoon, while on shore making some magnetical observations, I received the joyful intelligence that the *Gorgon* and our consort were in sight; they anchored at 4.30, just as the last turn of water necessary for our completion was going off, and we then set to work with the *Investigator* and filled her up before morning. I found from Commander M'Clure that he had followed close upon our heels, and that the two ships were scarcely ever more than twenty-four hours apart until the 30th of March, when they experienced the same south-westerly wind as we did. The *Investigator* then stood to the northward and westward, while we made southing at the expense of easting, but got into finer weather; had it not been for this we should most likely, owing to our being driven off on the day we made Cape Virgins, have arrived together in Possession Bay. The procuring of supplies at Sandy Point and the completing of our water would have detained us nearly to the present period, and it was satisfactory to think that no delay had taken place.

They hove to off Port Famine this morning, thinking to find us there. In the evening the vessels we had seen weigh in the morning returned to the anchorage, one of them getting back with some difficulty. The ship, it appeared, had been forty-five days in the straits, and one of the schooners having lost all her anchors at the first narrows, would have been in great difficulty had not the *Gorgon* been able to supply her with a kedge and small chain. They had, it

appeared, no large plan of the straits, but were navigating merely by the general chart of the Atlantic.

*April 18th.*—In the morning we shifted our berth and got hold of the *Gorgon*, but before we were ready to start the wind set in with violent squalls, and Captain Paynter doubting her capability of towing both ships against it, I resolved to economise her fuel and wait for finer weather. In the afternoon I accompanied him and Commander M'Clure into the inner harbour; we found that the wigwams on the island had recently been inhabited by the crew of a schooner, the wreck of which was laying on Point Milagro. We then pulled up to the head of the bay, and entered the river there, three miles, when the fallen trees obstructed our progress. The land in the vicinity of it was low and marshy, with a great quantity of berry bushes, of which we obtained a good supply and then returned, having arranged that if the weather would not permit our moving the next day, to send a party to collect them, as they would no doubt prove good antiscorbutics; and we also determined on endeavouring to land opposite to the wreck and obtain a day's fuel for the *Gorgon* by blowing her up. On our return we found that the flood tide had caused the vessels to swing, and in consequence of a bad look-out on board the *Enterprise*, she had shouldered her anchor, and was now foul of the *Gorgon*. It cost us some trouble to get clear, and was dark before we got again into a convenient berth for picking up the tow ropes. At 8 p.m. the *New World*, American steamer, arrived; this vessel, intended to ply upon the Sacramento River, was upwards of 200 feet long and drew only 5 feet of water; she was, by the captain's account, very swift, and he took care to let us know how he had beaten a British steamer on the coast of Brazil. The *New World* was launched with her machinery in and steam up, and went away from the stocks on which she was built on her trial trip at once; several others of the same class were building, and as a great deal depended on getting out first, so as to obtain the monopoly of the trade before rivals appeared in the field, the captain was very anxious to get on, and would not have put in here but for

an accident in the bursting of a gun, which had severely wounded one of his crew; he accordingly received medical aid from the *Gorgon*. As it was probable this vessel would arrive at Valparaiso previous to the departure of the Panama mail we put our letters on board of her, somewhat doubting whether so long and shallow a vessel would stand the mountainous swell of the Pacific.

I had the satisfaction to find that Mr. Miertsching was very happy on board the *Investigator*, and as he appeared very anxious to remain on board of her until our arrival at the Sandwich Islands, and he had become so general a favourite, that not only Commander M'Clure, but his mess-mates, the gun-room officers, would have been sorry to part with him, I would not subject him to the inconvenience of so hasty a removal, although we had a cabin prepared for him.[2a]

[2a] Mr. Miertsching was a Moravian missionary, and arrived at Plymouth only just in time to be tumbled into the *Investigator*. He was engaged as interpreter to the expedition.—[ED.]

*April 19th.*—The weather moderating after midnight, we were secured astern of the *Gorgon* at 3.30, and at 5.30 she proceeded with both vessels astern of her at the rate of 5½ knots. In the forenoon we sent the top-gallant masts and yards on deck so as to hold as little wind as possible, and passed Cape Notch at half-past 12. There is a sunken rock in the centre of this channel near this cape, which escaped the notice both of the *Adventure* and *Beagle;* its position was approximately pointed out to me on the chart by the master of the *Gorgon;* I could not, however, detect it from the mast-head, and consequently lost the opportunity of fixing it. It is, however, buoyed by kelp, and therefore only dangerous at night. The afternoon proved remarkably fine, affording us a clear view of the Land of Desolation and the glaciers on that side. Two canoes with Fuegians made their appearance, but the weather was too fine to admit of delay, in fact so fine a day is seldom seen in these regions; while the surveying vessels were employed in this portion of the straits, one side could seldom be seen from the other,

although but two miles across; this, with the violent squalls and few places where there is anchoring ground, interfered materially with their operations; but from what we saw I have no doubt some convenient stopping places will be found on the south side; as it is now, a vessel caught in a breeze before she attains the length of the Playa Parda Cove has no alternative but to put back into Borga Bay, as the violence of the squalls and the send of the sea render it impossible for the best handled and found vessel to make way to the westward. Several have become so disheartened by repeated failures in the attempt to get through Sea and Long Reach that they have borne up and gone round Cape Horn, while others have had recourse to the Magdalen and Cockburn Channels, and got into the South Sea by that route. At 5.30 p.m. we stopped to freshen the nip of our hawsers; the night looking fine I determined on proceeding, and accordingly made all arrangements should the weather outside prevent our communicating again. The boatswain of the *Investigator* having been left behind at Plymouth, I appointed the chief boatswain's mate of the *Gorgon* to the vacancy, and having exchanged a bombardier of the Marine Artillery (who it appeared had not volunteered for the expedition) for a corporal of the same corps and an A.B. who was already dissatisfied with the cruise, we went on; getting a slant of wind off the north shore enabled us to set our fore and aft sails, and at midnight Cape Tamar bore S.W.[25]

[25] The Portuguese form of the name of this celebrated discoverer is Magalhaens; that given in the text is the English form of it now in use.—[Ed.]

## SECTION II.

### MAGELLAN STRAITS TO SANDWICH ISLANDS.

*April 20th.*—In the middle watch we took advantage of the smooth water to point our top-gallant masts, and after 4 the effect of the swell from the Pacific increased rapidly. The *Investigator* was made fast astern of us by two 6-inch whale lines, one of which stranded at 7; but by slackening speed we managed to send our stream cable to her and caught a turn just as the second whale line parted; we then veered the gig astern with a second whale line and got it on board of her with some difficulty, the swell being so heavy that the vessels frequently took a sheer, and the boat narrowly escaped being upset by the tightening of the stream cable. At 8 Cape Pillar bore S. by W. ½ W., and being favoured by a light air from the eastward all sail was made, notwithstanding which the height of the waves brought every now and then so fearful a strain upon the tow ropes, that it was impossible to hope they would hold on much longer. All we looked for was that before they carried away we should be so far from the land as to enable the *Gorgon* to, proceed with one vessel and return in time to extricate the other. This fortunately happened, the stream cable and whale line by which the *Investigator* was being towed both carrying away at 11; so we proceeded on alone till 1.30 p.m., when I sent the *Gorgon* back to our consort and directed Captain Paynter to tow her off shore till midnight and then rejoin us. The wind chopped round to the N.W., and at 5 a.m. 21st, reduced us to treble-reefed topsails; however, we had made sure of our offing and were fairly in the Pacific.

It had been contemplated that the most advisable route to pursue would have been to turn to the north after rounding

Cape Tamar, and passing through Beaufort Bay inside of the islands up to the Gulf of Penas. Captain Paynter, however, being of opinion that in some parts of the channel he could only take one vessel at a time even in fine weather, and that with a strong breeze against us he could not make way with two vessels in tow, it became a matter of doubt whether we should not lose time. I had not, however, made up my mind on the subject, and most probably had the wind come in from the westward I should have taken the inshore channel, but the light air in our favour induced me to get into the open sea at once.

Having thus got into the Pacific, I may say a word or two on the comparative advantages of this passage over that round Cape Horn. To fore-and-aft rigged vessels it will be, I have no doubt (notwithstanding the wrecks that have occurred), a favourite route, and I should recommend them to take the northern channel so far as they are able, and not encounter the swells of the Pacific until they reach the Gulf of Penas; but in a square-rigged vessel I should infinitely prefer the lottery of Cape Horn, feeling assured that although some lucky runs have been made through the straits, yet in the average the other will prove the shorter of the two, and certainly with less risk. The difficulty of the passage commences at Cape Froward, where the tides leave you; up to that point it merely amounts to professional skill. The Magdalen and Cockburn Channels are certainly then open to you, and would secure your being to the westward of the Horn, but the scattered rocks between St. Paul's and Noir Island would place a ship in a very critical situation during short daylight. Should the vein of coal prove good at Point Arenas, and the Chilian Government establish a steam tug, the straits will then, I have little doubt, prove the more advantageous route; but even in that case vessels must expect detention at the west end, owing to the prevalence of gales of wind against which a steam vessel could not tow; and our passage (the *Enterprise* being ten days and the *Investigator* four in the straits) must be considered as more than ordinarily good, having been favoured by uncommonly

fine weather. The transit from the Pacific to the Atlantic can be more easily effected, and the seaman has only to calculate whether he has daylight sufficient to reach one of the harbours or to run through Crooked Reach, to assure himself of a passage without danger or delay.

*April 21st.*—The wind increased on the morning of the 21st, reducing us to treble-reefed topsails. The *Gorgon* rejoined us on the afternoon of the following day; the sea was too violent to admit of communication, and her fuel being nearly expended, I made the signal to part company on the 23rd.

Westerly winds prevailing, our progress was sadly delayed, and we were compelled to pass to the eastward of Juan Fernandez, nor was it until we reached the 26th degree of latitude on the 13th of May that we obtained easterly winds; these hung to the northward of that point, and we did not obtain the regular trade wind until in the 11th parallel.[3]

[3] THE PACIFIC.—Captain Osborn quotes from the *Investigator's* journal, the quiet and lonely character of the Central Pacific Ocean: no ships, no creatures even to be seen; and such the even tenor of their way, that neither *Investigator* nor *Enterprise* drew in canvas while crossing it, or indeed until they got into the Arctic Sea. *Enterprise*, Aug. 27th (73° N.), "reefed topsails—first time since 32° S.—11,300 miles." *Investigator*, July 26th (Behring Strait), "studding sails down—first time since Sandwich Islands," and indeed since lat. 17° S. A month later in the same year the present writer crossed from Tahiti to Honolulu in a schooner of 30 tons in the vain hope of catching the ships at the latter island, and in a month's voyage only lay to once.—[ED.]

The Equator was crossed on the 7th of June in longitude 120° W.; and the N.E. trade wind met us in the 6th degree of north latitude and carried us up rapidly to the Sandwich Islands, when, as usual in their vicinity, variable winds were experienced. On the 22nd Mauna Roa was seen bearing S. 55 W. 84 miles; running along the north face of Maui, we came to, off Honolulu, at 9.30 p.m. on the 24th. Here we found H.M.S. *Swift* with despatches waiting our arrival, and with her assistance and that of the natives hauled the ship into the harbour next morning. Captain Kellett I found had proceeded to the north a month previous,

but left behind him for our use a set of charts and sailing directions, which were likely to prove most useful.[4]

[4] Among these was a private letter from Captain Kellett, dated May 20th, 1850, which contains so much useful advice that some extracts may well be given:—

"If you should be obliged to pass through the Aleutian group, by all means prefer the Straits of Seguan (Amouchta); they are wide, safe, and free from races, which none of the others are. I have passed through them; you will find a very good description of them in the book I have left for you, translated from the French by my purser." Notice of this passage was left for the *Investigator*, and she took the hint and went through it, and thereby gained three weeks over the *Enterprise*. She arrived at Honolulu a day after her consort left, who had waited five days for her.

"That you will be very late is beyond a doubt. You can hardly reach the ice before the middle of August; at that time there is a very perceptible breaking up of the season. These seas may be navigated by a jolly-boat during the months of July, June, and part of May, but I experienced strong and frequent gales in the month of August, with a very short uneasy sea. The weather improves again early in September. . . .

"Your object being to get to the eastward, it is to be considered which is the best route. . . . From all we know, and from the natives' account, the ice collects and packs heavily on Point Barrow—opens but for a short time, and not every year.

"I believe that the vicinity of a river is to be avoided by all means as a wintering station. The ice I see was once forced completely over the island on which Fort Good Hope *was* situated. . . .

"From this (the mouth of the Mackenzie River) to get you into the Atlantic [Kellett's lively spirit had already pierced the unknown region between the American coast and Barrow's Strait], it is pretty certain that ships of your size could not pass by the route of Simpson. It is obvious, therefore, that you would be obliged to get directly north so as to avoid Victoria, Wollaston's and Banks' Land, which may either be one great land or a mass of islands: by this route also you would almost ensure your friends not being to the westward of you. You are now at Parry's Islands—get home as fast as possible by the old track. . . . By following the coast you will be exposed to being beached; almost impossible to avoid it. . . .

"I have no faith in the sea being clear for any time by the fact of not *seeing* ice, for in these seas at least packed ice cannot be seen more than ten miles. . . .

"As for a Polar basin—there may be one, but well filled with lumps of ice. Wrangell's always coming to open water proves nothing, from the circumstance of its not being visible at a greater distance than ten miles. . . .

"Arctic voyagers can tell you when they are approaching ice, at a

considerable distance, by the *blink*, and also when in the pack, of open water by the sky. . . . I am not trying to make you believe that these appearances are humbug, but that they may be carried too far by an imaginative mind. . . .

"I consider that when the sea is open clear water will always be found in the meridian of East Cape, farther north than on any other. . . .

"You will bear in mind in wintering in any of these ports, that a vessel, choosing her time for leaving the Sandwich Islands, will always get into Behring's Sea long before the vessel wintering there is free of ice. The *Plover*, within forty hours' sail of Kotzebue Sound, having cut cut through 1½ miles of 5-foot ice, only reached there twenty hours before me.

"Beechey says that a vessel would require to enable her to winter there good anchors and cables. For goodness sake don't try that, for if your anchors and cables hold, the ice would pass right over you. . . .

"Your sincere friend,

"HENRY KELLETT."

Kellett *was* "dear Coll's" sincere friend, and had been so through sunshine and through rain for many a year. He was a warm-hearted and lively Irishman, with the quick perception of his countrymen, and perhaps, too much of their desire to please everybody for a naval captain; too quick in his judgment sometimes, as we see in his dictum about Simpson's route and Victoria Land. But this letter evidently much influenced both Collinson and M'Clure, for they both tried to follow its advice, and "get directly north," and M'Clure nearly reached those "Parry Islands," but stuck there instead of getting home "as fast as he could."—[ED.]

We set to work to complete our water and provisions, and with assistance from Captain Aldham managed to find time to give our men a run on shore, where I regret to say some of them got into trouble by attempting to take some of their shipmates out of prison, where they had been put for violation of a law that they were unacquainted with. I appealed from the decision of the magistrate to the King in Council, but was unable to obtain a hearing previous to our departure, and therefore compelled to leave the matter in the hands of our Consul, General Millar, who I felt sure would see the business properly adjusted.

London: Sampson Low, Marston, Searle, & Rivington.

## SECTION III.

### Sandwich Islands to the Polar Sea.

Having experienced the kind hospitality of General Millar, and been a witness to the anxiety, even in this out-of-the-way corner of the globe, which was felt by all the foreign residents in the relief of our missing ships, we cast many an anxious look to leeward in hopes of seeing our consort; but as the season was far advanced I determined on proceeding alone, trusting that our detention in communicating with the *Herald* or at the edge of the ice would give her time to rejoin us. Our provisions and water being complete, we put to sea on the morning of the 30th June, receiving the good wishes of the French frigate *Bayonnaise* as we passed under her stern. I then bore up for Oneechow, intending to lay in a stock of yams, which, owing to the demand in California, were scarce at Honolulu. Rounding the south point of the island, we hauled up under its lee for Yam Bay, and sent two boats on shore, which returned at noon, having procured but a few; in fact, the demand for labour in California, together with the number of natives employed in the American whaling fleet, has nearly depopulated these islands, which under proper care would prove an admirable garden for the supply of the mining district.

Making all sail, we left Bird Island to the westward, and followed the *Blossom's* and *Herald's* track. As we hauled to the north after running down our longitude, the trade wind left us, and we were vexed with light baffling winds, scarcely making any way until the 12th July, when we had a fine breeze for forty-eight hours; but it again left us, and we remained becalmed until the morning of the 18th, thus seeing our summer waste away.

After crossing the 40th parallel we fell in with the fogs mentioned by Cook, but as a compensation, bringing with it a fine south-westerly wind which rapidly carried us past Attoo, but again, in latitude 57°, we suffered detention by calms and light airs for a week, nor did we make the island of St. Lawrence until the 11th of August, when a fine breeze carried us through Behring Strait; passing three American whalers, one of which appeared to be flensing.[5]

[5] *Flensing* is the term for part of the process of extracting the blubber from the whale.—[Ed.]

Another under whose stern we passed close, in hopes of obtaining some information respecting the *Herald* or *Plover*, but owing to an indiscreet use of the speaking trumpet we could not understand what he said.

On the 3rd of August, while becalmed, advantage was taken to fill a water-bottle at the depth of 148 fathoms; the temperature of the sea there being 34·5°, and at the surface 50°; the bottle could be seen at 9 fathoms, and the current was scarcely perceptible; the boat's head being W. by S.; lat. 58° 1′ N., long. 183° 28′ W.; colour of the sea, Fig. 5 in Hayes' 'Nomenclature of Colours,' Plates 33 and 34.

At 5.30 a m., August 12th, East Cape bore N. ½ E., and the weather, although gloomy with squalls, cleared up at times, giving us occasional glimpses of the Diomede Islands and Cape Prince of Wales; at noon East Cape bore N. 60 W. 11 miles; on this bearing it appears very like an island, the isthmus connecting it with the continent being so low as not to be visible even from the mast-head. After we had passed the cape, three boats were seen under sail in shore; the weather being very hazy with rain we could not make out what they were, and I was very much inclined to bear away and communicate, but seeing they did not alter their course I felt assured they had no desire to communicate, and consequently could not belong to the expedition; and an hour now of the season being valuable we continued our course, making good progress, with the wind from the east

all night, and shaping a course for Point Hope, the first of Captain Kellett's rendezvous. I had little doubt but that we should fall in with the *Herald* in the morning.

*August 13th.*—We made the land on the weather bow at 3.30, and soon found we had been set not only to the north, but also to the west, and could not fetch Point Hope. Hauling up for the Asses' Ears (the second rendezvous) the wind headed us off, and we only reached Cape Lisburne.[6]

[6] Another piece of ill-luck. Kellett had told him in his Honolulu letter that he would leave three bottles, containing information for him, at Point Hope, Cape Lisburne, and Wainwright Inlet. Had the *Enterprise* found either of these on her way north, she would have learnt that the *Investigator* had gone in ahead of her, and would probably have determined to push on past Point Barrow to join her consort, instead of returning as she did to the south. When she did find the one at Point Hope on her return south (August 31st), she subsequently went north again to look after the *Investigator*.—[ED.]

Here we anxiously scanned the horizon for the *Herald*, and the shore for any sign of a mark, but without success, and I was about to proceed on to Wainwright Inlet (the last rendezvous) when Dr. Anderson pointed out what appeared to him to be a whitewashed mark. I left the ship at 11.30 to examine it. We found the cliffs surrounding the cape inhabited by a colony of loons, that flew past us in flocks of hundreds, without apparently making any diminution in the numbers remaining. On landing, the whitewashed mark proved an ice cliff at the bottom of the gully, and while I had the ship's name painted on the rocks and attempted to ascend the hill, Dr. Anderson and Mr. Whitehead, who were with me, set to work loon-shooting, they knowing from experience that the birds in question were capital food. The disintegration of the cliff by the action of the frost soon stopped my progress, there being scarcely a stone on which you could rely for either a firm grasp or tread; so getting into the boat and expending another half-hour in getting loons, we commenced our return on board, and had got scarcely halfway off, when our attention was attracted by a loud shouting on the summit of the cliffs under which we had landed,

and we presently made out three persons. Having by aid of the glass satisfied myself that they were natives, I could not afford to lose any more time, more particularly as our means of communication must have been very vague; so with some reluctance we got on board at 2.30, and having thrown a cask overboard with information, bore away for Icy Cape, the long low point of which we saw at 8 p.m. At 10 we threw another cask overboard and hauled to the eastward.

*August 15th.*—The morning proved thick, and knowing we were somewhere in the neighbourhood of Cape Collie, we anxiously looked for some mark wherewith to recognise it, but the low cliffs were so much alike that it was impossible to make out the land. While in the act of hauling off to wait for clearer weather, it fortunately lifted, and we just caught sight of a tall post, which I felt assured must be the *Herald's* mark. The day being thick and lowering, I did not like to leave the ship embayed as we were, and accordingly sent the Senior Lieutenant, Mr. Phayre, who landed and walked up to the post, which turned out to be the same native mark described in Captain Kellett's journal last year. Footprints both of moccasins and shoes were seen, and part of a boat's gunwale, painted, showing that both natives and Europeans had been recently on the spot. Seeing something like a mound on the opposite side of Wainwright Inlet, Mr. Phayre crossed and searched in vain for any information. He returned at 3.30 p.m., and we made all sail to the north.

## To the Polar Sea.

*August 16th.*—Thick foggy weather with a light breeze from the N.E. The temperature of the sea indicated our approach to the ice, and at 7 a.m. we fell in with one large and two or three small pieces; we were then steering W.N.W. true, and hauling up north so as to feel the edge of the ice. The temperature of the sea, however, again increased, and it was not until 10 that any more ice was seen; now it became frequent, and at length we tacked at the edge of a closely

MAP OF
WEST ARCTIC AMERICA
showing the tracks of
H.M.S. ENTERPRISE AND INVESTIGATOR in 1850-54
A L A S K A
(UNITED STATES TERRITORY)
A S I A

packed lot, which could have been sailed through; but as we could not see far enough to detect what was beyond, no object could have been gained by going into it.[7]

[7] ICE BLINK AND WATER SKY.—These are two names for the respective appearances in the sky which indicate to experienced Arctic voyagers the existence of a field of ice or a great expanse of open water in that particular direction. According to Captain Kellett these appearances are not always to be trusted; or rather, we may say, it requires much experience and good judgment to interpret them accurately: for they are real, because quite natural phenomena, being simply the reflection in the sky of what is on the sea.

In the case of ice, the reflection has a bright yellowish tinge; the word "blink" is an adaptation from the Danish Greenlanders, signifying really the whiteness of ice or snow, but it is (in English) fairly expressive of the reflection of such whiteness in the sky. After all it is only an indication of what exists for a distance of about ten miles.

In the case of open sea, the reflection is of a dark cloudy character, and appears to be more dependable as to the actual existence of water, but not as to the extent of it; for a small lane or pool in the ice will make a show in the sky. And there is another valuable indicator of water, in the vapour that so frequently arises from it, especially when the ice is forming and breaking up. This vapour, from some effect of it on the light, generally assumes a dark appearance; and being carried by the wind for a considerable distance, is a more distant as well as a safer guide to the existence of open water. Another indication of open water is the temperature of the wind, which is, of course, higher coming from water than from ice or snow.

Mr. M'Dougal (*Resolute*) mentions a remarkable false ice blink seen to the south of Byam Martin Island in August, 1854, which gave the idea of the pack being within a few hundred yards, although they knew there was open water for miles in that direction.—[ED.]

The weather cleared up shortly after this, and we were enabled to see what we had to deal with. The whole sea seemed full of streams of ice, that is to say, small pieces congregated together with open lanes between. The wind being light, we worked round them, making our way to the north-eastward; we got our whale boats out from the skids, and the crow's nest aloft, and the spike plank across.[7a]

[7a] *Spike plank* is the term for a gangway made for the pilot over the deck.—[ED.]

At midnight we were in the centre of a stream of

rotten ice that scarcely detained the ship at all, going 5·5 knots.

*August 17th.*—This morning after clearing some large pieces and seeing heavy packed ice to the westward, we got into open water, in which we sailed for fourteen miles and had a perceptible swell from the eastward. The wind being at 3, and varying from N.N.E. to E.N.E., weather uncommonly thick. Standing to the N.N.W., at 8 we were again in sailing ice, which compelled us, in consequence of the increasing size of the floes and their becoming more closely packed, to hark back at 9.30 after experiencing some heavy thumps. The fog cleared away at 1 p.m., and we found ourselves in a lane of clear water 10 miles wide with a clear sea to the N.E. and S.S.W., the ice heavily packed to the westward. Our observations placed us 100 miles N.W. by N. from Point Barrow, and we found 45 fathoms of water, muddy bottom. The wind died away and we scarcely moved until the morning of the 18th August, when a light air springing up from the westward, we steered again for the north, and by 7 were again surrounded by floe pieces, which being in motion involved the likelihood of being beset, and induced me to haul out while we could. At 9.30 we were again in clear water and stood to the southward, the weather being very hazy, scarcely able to see a cable's length; having made the edge of the ice at noon, we kept along it to the N.E.; at midnight we were so closely surrounded that we had to lower a boat to get her head round; at 5 the fog rose, and we found ourselves close to the pack edge, with open water only to the S.S.E.; in that direction we hauled out, skirting the eastern edge in search of an opening. At noon, having run 26 miles, we found the pack trending more to the eastward, along which we ran, sailing through loose pieces and keeping the main body in sight without detecting any open water to the N.E., and in the afternoon we passed some large floes to the southward of us.

*August 20th.*—At 4 a.m. Point Barrow bore due south 25 miles, and, after rounding the point of the pack, we had the gratification of seeing no ice to the eastward, and the

temperature of the sea rose to 40°, and we had no bottom with 60 fathoms; we thought ourselves fairly on the way to Banks' Land or Melville Island, for which a course was shaped. We were, however, compelled to keep away to the southward at 9 o'clock, finding ourselves embayed in a horse-shoe, round which very heavily packed ice could be traced from the crow's nest. Having run through the stream off its eastern horn, we once more found ourselves in open water, and stood again to the east, keeping the pack in sight to the north.

*August* 21*st*.—At 4 a.m. we found the ice stretching across our bows from E.N.E. to S.E. by S., on which we tacked to the north, as the ice was not visible in that direction; and a thick fog occurring, it was only made out by running into it, which we did at 6 a.m., and then stood out to the S.E., so as to examine the upper part of the bight. On arriving at its edge we ran along inside the line of ice, endeavouring to push easterly, but the increasing closeness and the size of the floes edged us off to the southward: some of these were 25, and one or two as much as 30 feet above the water. Towards noon the fog cleared off, and we found ourselves much encumbered, the prospect to the eastward being decidedly against our progress in that direction. Pools of water were seen certainly, and we attempted several times to push our way into them, but were constantly warned by the ice mate from the crow's nest that the close pack would stop our progress. At 8 o'clock we were within 30 miles of the land, and no water to be seen in that direction from aloft. I was therefore under the necessity of determining whether I would attempt the inshore passage. A careful perusal of the Arctic voyages along the north coast of America, as well as a personal communication with Sir George Back, who was kind enough to give me the benefit of his experience previous to leaving England, had fully convinced me that I could look for no place of safety for a vessel of the *Enterprise's* draught of water nearer than Cape Bathurst, which I could scarcely hope to reach previous to the winter setting in, and the ice closing on the shore. I therefore reluctantly gave up the examina-

tion in this direction, and made my mind up to turn the edge of the pack further to the west, where Captain Kellett had penetrated last year, and seen a promising opening, and where Captain Moore had reported the loom of the land. But as a person always feels the importance of having the opinion of others in aid of his own, I addressed the following order to the officers :—

GENTLEMEN,

It is my direction that you give me your opinions as to our future progress to the eastward under the following form :—

| Practicable or not. | In Shore. | Off Shore. | Signature. |
|---|---|---|---|
| Not. | Not. | Not. | G. A. Phayre. |
| Not. | Not. | Not. | John Barnard. |
| Not. | Not. | Not. | F. Skead. |
| Not. | Not. | Not. | Geo. Arbuthnot. |
| Not. | Not. | Not. | John Atkinson. |

*Remarks.*—Having traced the pack in a south-easterly direction for 145 miles, from latitude 72° 45′ N., and longitude 159° 5′ W., and being compelled to retrace our course to the S.W. 50 miles, in consequence of its taking a trend in that direction, leaving no signs of an opening towards the E. or S.E., the only open water being from S.W. to N.N.W., we consider any further progress to the eastward to be wholly impracticable *off shore.*

With respect to our getting to the eastward by pushing in that direction in shore, the following facts are to be considered:—1st, the wind is directly foul; 2nd, the weather has just become foggy; 3rd, the ice is closely packed as far as the eye can reach (an extent of 10 miles), reducing our distance from the shore to 15 miles, together with the great improbability of our being able in a heavy ship on a shallow coast, with a very doubtful passage and a foul wind, to make any easterly progress; and 4thly, no place for anchorage being nearer than 500 miles. All these things being con-

sidered, we are of opinion that any further attempt to get to the eastward by running to the south-westward looking for open water would be a useless waste of time.

G. A. PHAYRE, Lieutenant.
JOHN BARNARD, Lieutenant.
F. SKEAD, 2nd Master.
GEORGE ARBUTHNOT, Ice Mate.
JOHN ATKINSON, Ice Mate.

H.M.S. *Enterprise*,
August 21st, 1850.
Latitude, 71° 42′ N.
Longitude, 154° 29′ W.

This report afforded me some satisfaction, although I should never hesitate to take the responsibility in these cases on my own shoulders; yet the urgent need of aid, that our missing friends must by this time be in, rendered it absolutely necessary that we should persevere so long as hope remained; and we had yet sufficient time remaining to enable us to get in with any land that might be discovered to the north, and, once established there, our travelling parties would have been in a better position for exploring than on the continent; but still it was with extreme regret I retraced our steps along the pack edge to the westward, intending to push through, if possible, at the point where we had first fallen in with the heavy ice on the 17th.

*August 22nd.*—The morning proved very hazy, and continued so throughout the day, but we managed to catch a glimpse occasionally of the ice to the northward. The 23rd fortunately proved finer, and we then found the main pack trending north and south, the ice at its edge being much closer than it was four days ago; this compelled us to go southward. We worked close along its edge, expecting each tack to find an opening fit for our purpose, but without success; and it appeared that, when we first made the ice on the 16th, we must have run close along the edge of this body without being aware of it.

*August 24th.*—The fog cleared away and showed us the packed ice still trending to the southward and eastward, while to the north and east we had a perfectly clear sea. I therefore made a long board towards Point Barrow, intend-

ing to examine it, but, the wind heading us off at noon, I again tacked to the southward. Towards evening we got again in with the ice, and, the fog again reducing our limit of vision to two cables' lengths, we had some difficulty in probing our way; but, believing we must be very close to the southern end, we continued on until 8 p.m., when the fog becoming yet denser, and it being nearly impossible to move the ship in any direction, we made fast to a large floe and filled nine tons of excellent water. The weather clearing up at midnight, we cast off and made sail, but did not succeed in extricating ourselves by boring through these closely packed floes until 4 p.m., August 25th, when we reached open water. At 8 p.m. we turned the southern point of the pack, which we found to be in 71° 10′ N., or twenty miles to the southward of where we had found it on the 16th.

*August 27th.*—Running along the southern edge of some closely packed floes and occasionally through the loose streams, the walruses, which had hitherto been very scarce, became numerous, and were seen laying on the ice in herds of from three to twenty. At noon the edge of the ice trending to the north, we joyfully hauled up in that direction. The wind increasing with a short sea, induced us to reef our topsails, being the first time we had done so since leaving the parallel of 32° S., during which time we had been over a space of 11,303 miles in 116 days, a period of distance and fine weather combined, I believe, unprecedented in the annals of navigation.

*August 28th.*—Early in the morning we tacked off the edge of some heavy floes closely packed, the main line trending W.S.W. and E.N.E. (true). During the forenoon a bear was seen, and we continued working along the edge easterly, looking for an opening without success. Here we reached our furthest point north in 73° 23′ N., and longitude 164° W. In the afternoon the pack edge trending more to the southward, we got much encumbered by endeavouring to get through it to the eastward, straining our eyes in that direction in the hope of seeing either land or water. Finding, however, the further we entered the more compact it was becoming, I hauled out

to the west at noon, being compelled to come to the conclusion that this season had passed away without our being able to do anything towards the succour of the missing expedition. Getting into open water, we skirted along the edge of the ice, leaving it to the eastward. Here we saw two bears, and coming upon a herd of walruses, as delay no longer interfered with our duty, the two whale-boats were sent, and succeeded in capturing three. The tusks of one measured 23 inches, and the weight of the head and neck was 107 lbs.; the hide, without the flippers, 208 lbs. Reserving the best part of the carcases, we found ourselves in possession of about 1200 lbs. of good wholesome food, and three casks of blubber.

### Turn South.

*August 30th.*—Continuing our course to the southward, in the forenoon we caught sight of the high land east of Cape Lisburne, off which we were at 9 p.m., and reached Point Hope at 6 a.m. the following morning. Here we saw a great number of fishing stages and several natives. I accordingly landed, accompanied by Dr. Anderson, and was met on the beach by eight or ten Huskis, miserably clad and ugly-looking, who showed no signs of fear, and immediately tendered their salute, which could not be denied, however disagreeable it may be to rub noses with a face that has never known water, unless against its owner's consent in a shower of rain. While the doctor amused them, I walked to the end of the Point, where I found a post with "*Herald VIII. 50 a bottle, 10 feet magn. north.*" This was soon measured, and the first thrust of the spade into the shingle showed that the Huskis had not detected the *cache*. By its contents I found the *Herald* had left five days previous for Grantley Harbour, where it was proposed to lay the *Plover* up this year, Kotzebue Sound having proved too exposed an anchorage. And I learnt, what astonished me very much, that the *Investigator* had reached Cape Lisburne on the 31st of July, and had been last seen by the *Plover* off the Seahorse Islands on the 4th of August. She must have had a most

surprising run from the Sandwich Islands, and by a lucky chance avoided all the calms and light winds we were pestered with.[8]

[8] Separation of the Ships. (See Appendix.)

Having buried information to the effect that we were bound for Grantley Harbour, I found the doctor at the entrance of a miserable low skin tent, evidently a temporary habitation, and in the course of his barter for a few curiosities he fell in with half of a letter which one of the natives had in his pouch, and which was only discovered by turning out its contents; the other half I presume became the property of some one else. There was sufficient, however, to prove that it was from Captain Kellett, and contained similar information to that I had already acquired from the bottle. Having given them a little tobacco, a couple of knives, and some beads, with two of Mrs. Washington's gaily dressed dolls to the children, all of which they received as a matter of course, and without any great expression of thankfulness, we took our departure, and crowded all sail to the southward.

*September* 1*st*.—Early in the morning we caught sight of the summit of Cape Prince of Wales, and shortly afterwards saw the Diomede Islands through the mist; the latter, being level-topped, afford a very good landmark in contrast with the adjacent shores on each side, and enable a vessel to make sure of her situation, which is a great advantage in the navigation of the straits. Rounding Cape Prince of Wales at noon, we stood along shore to the eastward, entering Port Clarence about 7 p.m., when our glasses were anxiously directed towards the upper end of the harbour, in hopes of seeing either the *Herald* or the *Plover*. Nothing, however, was made out until 8.30, when we saw a light, and, having burnt a blue light and a rocket, had the satisfaction of seeing them answered. At a quarter past 10, Captain Moore of the *Plover* came on board, and reported that he had not seen the *Herald* since the 17th ult. He reported also that, according to arrangements made by Captain Kellett, he was busily employed preparing his winter quarters, and building a house for the reception of the provisions and stores the *Herald* had

to supply him. The *Plover*, it appeared, was laying in a cove on the north side of Grantley Harbour in 2½ fathoms; that there were 2¾ fathoms not far from her, but that I should find some difficulty in getting a vessel of the *Enterprise's* draught of water into the inner harbour. As the *Plover* had now passed two winters in these regions, it was my intention to take her place, and allow her to go to the south to refresh her crew; and with that intention we came to an anchor at 11 p.m. in 6½ fathoms. Captain Moore returned to his ship, but left the second master, Mr. Martin, to assist us in finding out the channel.

## SECTION IV.

### PORT CLARENCE AND ICY CAPE.

*September 2nd.*—At dawn we weighed and stood towards the entrance of the harbour; the wind proving very light, I left the ship with the intention of examining the channel, and seeing whether the *Plover's* position would suit for winter quarters for the *Enterprise;* leaving orders to anchor close off the bar in 4½ fathoms, and then send the second master to assist me in buoying the channel. Finding the latter very shoal and the channel not only narrow but crooked, I dropped one or two buoys and went inside Grantley Harbour to judge whether it was a fit place for us, and that our labour in getting in might not be thrown away. On getting on board the *Plover* I found that the *Enterprise* was on shore on the bar, the officer in charge having very improperly, and against the advice of Mr. Martin, run for the outer buoy instead of anchoring as I had ordered him. I accordingly made the best of my way back on board of her, and, having laid out the stream anchor, hove her off without any damage. The wind in the evening freshened from the S.W. and brought in a considerable swell, causing us to be very thankful that the ship was extricated from her awkward situation.

*September 3rd.*—The morning set in with bad weather, and we were unable to send the boats away until the afternoon, when Mr. Skead was despatched to examine the north shore of Port Clarence with a view of seeing whether any position existed along it which would afford us the required shelter. I took Mr. Arbuthnot (ice mate) with me inside of Grantley Harbour, so as to have his opinion on the likelihood of the *Enterprise* being able to remain here during the winter

without risk of being crippled for the ensuing season; and finding it to be his opinion, as well as Captain Moore's, that, notwithstanding the long exposure towards the upper end of the harbour, there was every likelihood of our being able to remain afloat, I proceeded to the examination of the entrance and laid down buoys to direct our course in. Mr. Skead returned in the evening without succeeding in the object for which he had been sent.

*September 4th.*—At 4 a.m. we got under weigh with a light air, which soon left us, and we commenced warping towards the bar; when within a mile of it, the breeze again sprang up and we made sail, steering for the outer buoy; before reaching the second one the ship grounded in 15 feet, and on examination it was found that the water had fallen 4 feet during the night, which must have been occasioned by the wind changing from north to south, as no rise and fall beyond a few inches had taken place by the beach previously; and, finding that a buoy we had laid down in $3\frac{1}{4}$ fathoms the evening before had now but $2\frac{1}{2}$ fathoms, I determined on keeping the ship outside until a more extended examination should convince me that I should be able to get the ship out next season without liability to detention; this, however, proved to be a work of more labour than we imagined, and after several ineffective attempts it became evident that it would be necessary to lighten the ship. Fortunately the *Herald* arrived in the afternoon, and we experienced the benefit of a friend in need: a great quantity of provisions and stores were sent to her immediately; a Bower anchor and chain laid out, and our chain cables payed overboard, where the ship could pick them up, but we did not succeed in getting the ship afloat until the afternoon of the 5th September, having removed rather more than 100 tons. The *Plover*, coming to our assistance, was unfortunate to get on shore, but both vessels were eventually got afloat without any harm occurring saving the wear and tear of ropes and men.

On the 6th September, while the ship's company, with the assistance of the *Herald's* people, were employed picking up

our anchors and chains and restowing the holds, Kellett and myself carefully examined the channel, and, coming to the conclusion that considerable delay might take place in getting the ship out early next season, I had to forego the arrangement I had entered into, viz., that of taking the *Plover's* place for the winter, and permitting her to go to the southward to recruit. This determination having been come to (which caused great disappointment throughout the vessel, as we had made our minds up to pass a winter in these latitudes), no time was lost in completing and storing the *Plover* for three years, which with the building of a house occupied us until the 13th. On the 10th I visited Point Spencer and Cape Riley with a view of seeing whether sufficient shelter could be obtained at either of these places; and having satisfied myself that there was not sufficient protection for the *Enterprise* outside of Grantley Harbour, I determined to go to the north and spend the remainder of the season about Cape Lisburne; so that, in the event of anything occurring to the *Investigator* or any of the missing expedition making their appearance, we should be nearer at hand, and save the boats a trip across Kotzebue Sound.

The *Herald*, I found from Captain Kellett, had been to Michaelowski to obtain information from the Russian authorities relative to establishing a communication with the Polar Sea, by means of their posts in the interior. From the information he was able to obtain (which, however, was not satisfactory owing to the person lately in charge of the fort having left in the annual vessel, and the Governor at present being totally unacquainted with the country), it appeared that they had no trading post on the head waters of any river emptying itself into the Polar Sea, and therefore he considered that attempts to search the Arctic Ocean by this route would prove futile.

During our stay here we were several times visited by the natives in their skin boats, but being so thoroughly occupied we had not leisure to barter, and, finding they were inclined to take advantage of the confusion while we were on shore to pilfer, we were compelled to turn them out without

ceremony. This required some time to explain, and it was only a day or two before we left that they communicated with us as freely as with the other ships. The encampment was fixed on the north spit between the two harbours, and we had latterly as many as five or six boats, each containing eight or ten people, who were somewhat under the control of two chiefs; from them we obtained reindeer's meat in small quantities and fish. Herrings were abundant, but unless you were fortunate enough to be present at a haul, and got them fresh from the water, they were immediately split open and anointed with seal oil so as to preserve them for their winter store. Being much occupied, and but few hands to spare, we only tried our seine once, and then with but little success.

*September 14th.*—Having completed our water, taken my farewell of Kellett, and entrusted our despatches to the *Herald*, we weighed with a light breeze from the eastward, which died away during the forenoon, and continued light and variable until 3 p.m. the next day, when it freshened from the northward, and we continued to work to windward under the lee of Cape Prince of Wales until 4 a.m., September 16th, when we steered out into the straits, and after making several boards without gaining anything to windward, owing to the current and short uneasy sea, we bore up at 10, and reached smooth water under Cape York, where we anchored in 10 fathoms 3 miles from the shore; King's Island bearing S. 12° E., and Cape York N. 72° E. Here we rode very quietly, notwithstanding squalls, which were violent during the night. On the morning of the 17th September we were visited by an *oomiak* with seven natives bound from *King-a-ghee* to Port Clarence; they produced some inferior skins for sale, and after remaining a couple of hours returned to the shore and commenced tracking their boat to the eastward. They were aware of the vessels being in Port Clarence, and confirmed several of Captain Beechey's names, giving us in addition that of *Ipnook* for Cape York, and *Chunnermuck* for the beach opposite to which we were anchored.

The wind moderating a little, we sent a boat on shore for firewood in the afternoon, and some of the officers went with their guns in hopes of picking up a ptarmigan or deer.

*September 19th.*—At midnight the wind having lulled, we weighed and passed Cape Prince of Wales at 8 a.m. In the afternoon it drew round to the southward, and, although 7 or 8 miles from the shore, we were visited by two *oomiaks*, one was on her way from *King-a-ghee* to the Diomede Islands, the other came off for the express purpose of traffic, both eventually returned to the American shore.[9]

[9] ESQUIMO BOATS.—*Kayak* or *kaiak* is a common name for a canoe throughout the Esquimo people, but it generally signifies a small canoe for one person. Its framework is of bone, covered with sealskin, leaving only an opening in the middle of the deck covering for the occupant: it is about 16 feet long, and weighs 45 lbs. (*Armstrong*). Captain Collinson got one at Cambridge Bay weighing 26 lbs.

*Baidar* is a large canoe, of wood or bone framework, covered with dressed skins, and flat-bottomed; about 24 feet long, 3 to 4 feet broad, with seats across (*Armstrong*).

*Umiak* or *oomiak*, a still larger canoe, used generally for carrying the women and children and goods from one part of the coast to the other (*Arctic Papers*).

They described the population of the Diomede Islands as about 300, and had evidently been in communication with the whalers, as they asked for rum under the denomination of strong water; and, on being given half a pint in exchange for four walrus tusks, the head man pressed the bottle to his breast and stroked it down with every symptom of affection. This was the first instance that spirits had been enquired for, or even liked when offered. The boats were fitted with a low sail made of walrus intestines, and patched here and there with all kinds of materials. One of them had got an iron cringle from some ship, which was lashed to the mast-head and used as a fair leader for the halyards. By way of adding to the buoyancy of the *oomiak* and rendering them less liable to upset, inflated sealskins were suspended over the side.

## Return to Point Barrow.

*September 20th.*—Running to the north at the rate of three or four knots per hour, we made Point Hope early in the morning, but having light winds it was afternoon before we were close up to it, and were visited by eight *oomiaks*, containing between sixty and seventy people, who made themselves quite at home, and proceeded to barter their bows, arrows and spears, together with their furs, for tobacco and beads. They had also evidently been in communication with vessels before, although we could not recognise a single individual of the party that were on the point when we visited it on the 1st inst. Lucifer matches were in great demand, and some good sable skins were obtained for two boxes. They gave us a pressing invitation to visit them on shore, and left the ship (after having had a most riotous barter) very quietly on being told. One of the party had the leprosy, all were filthily dirty, covered with vermin, some of which were transferred to our people, and caused the greater part of the purchases to be thrown overboard.

*September 21st.*—We passed Cape Lisburne at 10 a.m., and shaped a course for Icy Cape, the wind being still from the southward, and the temperature at 38°. Many were sanguine that there was yet enough of the season left to reach Point Barrow, and ascertain whether the deep water Captain Moore had found in Elson Bay would afford us a locality for winter quarters.

*September 22nd.*—At 4 a.m. the wind shifted to the north, and it was 5 p.m. before we obtained sight of the fishing stages on Icy Cape from the crow's nest; we then stood to the westward in order to get an offing in the event of the wind coming from that direction, which a falling barometer led us to expect. Nor were we mistaken, for it freshened on the 23rd from that quarter, reducing the temperature to 16°, and coating us with a mass of ice. At 6 p.m. we were under reefed courses, treble-reefed main, and close-reefed fore topsail. This bad weather continued throughout the twenty-four hours.

*September 24th.*—At 6 p.m. it moderated a little, and we made sail to the N.E., but the ice accumulated so fast upon our bows and sponsons, increasing the top weight of the ship and causing her to labour very uneasily, that our people were employed to chip it away; this, however, proved no ordinary labour, and, it being evident we were too far north for this season of the year, I bore up at 4 a.m. for Cape Lisburne, off which we remained the next day, and were then driven to take shelter under the lee of Point Hope by a gale from the N.N.E.

*September 26th.*—Here we remained until the 30th, experiencing very bad and cold weather, the thermometer never rising above 25°, and falling as low as 18°, rendering our bows, sponsons, and rigging a perfect mass of ice, which we beat off from time to time, but occasionally it was so thick that the only part of the anchor to be seen was the outer pea.

*September 30th.*—So soon as the weather moderated we took a close look at Point Hope, and, seeing no signs of any of our friends there, we felt quite assured that the season for navigating the sea to the northward was gone for this year, and there was no chance of any ship or boat emerging from the ice. I bore up for Port Clarence, and arrived at 4 p.m. on the 2nd of October. From Captain Moore we learnt that the thermometer with them had fallen to 15°, and ice 7 inches thick was formed in the inner harbour, thus winter making its appearance this year three weeks earlier than it did last season in Kotzebue Sound. Fortunately a thaw occurred and enabled us to communicate without difficulty and complete our water.

On the 4th of October we swung the ship for local attraction, and were ready for sea on Saturday morning, having supplied the *Plover* with such warm clothing and stores as we could spare, but were detained by thick weather and snow showers.

The weather on the 6th of October being somewhat similar, I remained, and in the afternoon sent our people on shore for a walk, they having been much confined to the ship, and a

long voyage before them. In the afternoon the wind shifted to the S.W., and, as we could not embark them by reason of the surf on the beach, they took refuge on board the *Plover.*

During the period of the *Plover's* stay in Kotzebue Sound, and subsequently during Captain Moore's expedition to Point Barrow, he from time to time received reports relative to white men and ships having been seen on the coast between Point Barrow and the Mackenzie; the substance of which, according to the date on which they were received, is as follows:—

1*st. Captain Moore, November* 11*th,* 1849.—The natives of Buckland River in Kotzebue Sound report that some northern people who had been trading with them had seen two vessels answering to the description of the *Erebus* and *Terror;* that they had been boarded by natives inhabiting the coast to the eastward of Point Barrow about the latter end of the summer of 1848, that they were working to windward against a westerly wind. After they had been on board for some time the water began to shoal, when the ships went about and stood to the northward, after which they were not seen.

2*nd. Mr. Pim, at Michaelowski Redoubt, March,* 1850.—Reports that two officers and eight men had been on a river named Ek-ko, within thirty-five days' travel of Michaelowski Redoubt; that they were in a very distressed state, having bartered guns and ammunition for provisions.

3*rd. Captain Moore, Hotham Inlet, March* 4*th.*—The natives of Hotham Inlet reported that four strange natives had arrived from the northward, who had told them that there were some white people at a place called *Kopak* (which is apparently near to Point Barrow), where they were building a vessel.

4*th. Captain Moore, May* 1*st.*—Four natives from the northward visited the *Plover* in Kotzebue Sound, one of whom, having come from the vicinity of the *Noa-tok,* says that he fell in with a party of natives, who told him that there was a vessel and a number of people a long way to the northward, with whom they had bartered knives. He also showed the

wooden model of a knife he had seen in the possession of one of these people, which was marked with the letter L.

*5th. Captain Moore, Point Barrow, July 27th,* 1850.—The natives of Point Barrow report that a number of people dressed like ourselves had arrived at a river called *Kopak,* that they were now dead and buried by the natives there.

*6th. Captain Moore, Wainwright Inlet, August 6th,* 1850.—The natives here reported that two boats had arrived at the *Kopak,* that the crews had quarrelled with the natives, who shot them with arrows and stabbed them with knives; one of the two boats was still at the *Kopak,* but the other was driven away by the sea.

*7th. Captain Moore, Port Clarence, September 18th,* 1850.—Some natives visited the *Plover* yesterday and brought information that a vessel had arrived at *Noo-wok,* some distance to the east of Point Barrow, that she was destroyed by the ice, and the people starved, a number of whom are represented to have been lying on the shore; from what I am able to understand, it would appear that this vessel, which they report to have three masts, must have been wrecked on the breaking up of the ice in the spring of 1849.

Although these reports were vague and unsatisfactory, yet still there appeared some foundation for them, and, determined as I was to leave no clue unravelled that might lead to the relief or discovery of the missing expedition, I had gladly availed myself of the offer of Lieutenant Barnard, who (having read Mr. Pim's Journal of his transit across the country from Kotzebue Sound to Michaelowski) had written me a letter offering to remain behind at that post and endeavour to gain information from the Indians resorting to the Russian settlements in the interior.[10]

[10] Another object in leaving these officers at Michaelowski was to give them an opportunity of learning something of the Esquimo language, the interpreter of the expedition, Mr. Miertsching, being in the *Investigator.*—[Ed.]

Feeling that it would not do to leave him entirely alone, although in the vicinity of the *Plover,* I took advantage of Mr. Adams, the Assistant-Surgeon, volunteering to accom-

pany him, and joined to them Thomas Cousins (A.B.), who had been with Sir J. Richardson during the recent expedition down the Mackenzie. Having arranged with Captain Moore that they were to communicate with him during the winter, I determined on putting into Michaelowski, and in the event of there being no objection on the part of the authorities there, and sufficient accommodation in the Fort for their first establishment, to leave them there. But as we had learnt from the *Herald* that the outer anchorage was very much exposed, and that there was not sufficient depth of water for the *Enterprise* in the inner harbour, we commenced their outfit, and got everything ready to land immediately the arrangements should be concluded.

### Leave Port Clarence for the South.

*October 7th.*—The wind moderating in the morning, we got our people on board by noon, and weighed at 5.30 the following morning, but made little progress until noon, owing to the light airs. The wind then came in from the westward with snow showers, which determined me to remain inside of Point Spencer for the night, and we anchored on the north shore about four miles from the entrance, and were well sheltered, having brought the end of the spit to bear as far south as W.S.W.

*October 9th.*—The night proved finer than we expected, and at daylight the wind was all gone; a light air, however, springing up at 6.30, we were soon under way, but, the wind proving light, it was the afternoon before we passed between King's Island and Cape Wooley, not obtaining less water than 6½ fathoms, but the bottom was very uneven; on the former we made out several winter huts and some tents near the summit.

*October 10th.*—A fine breeze sprang up during the night, and we made Sledge Island the next morning; but hauling round to the northward and westward caused a short chopping sea, against which we made but little progress, and did not get hold of Stuart's Island until daylight on the 12th. We

passed four miles to the northward of it in 6 fathoms at noon, and then shaped a course along the shore for Tebenkorf's Bay. Stuart's Island is rendered very remarkable by a tent-shaped hill.

As we ran along shore we caught sight of two objects to which our eyes had been strangers for a long time, viz., a church and a windmill, evident signs of civilisation. The wind proving light at 3 p.m., when we were still six miles from the settlement, I left with Lieutenant Barnard in the whaler, so that no time should be lost in the event of the Russian authorities showing a disposition to receive our intended expedition. Landing at the Fort a little before 5, we found some difficulty in communicating, as there were none of the party that could speak English. However, by means of Boski (a Californian, who had served last year in the *Herald* and *Plover* as interpreter, and accompanied Mr. Pim across from Kotzebue Sound), and doggerel Spanish on my part, I made known the object I had in view, and found every disposition on the part of the chief trader to afford us assistance. He most hospitably gave up part of his limited accommodation to the party about to remain. I therefore made the preconcerted signal to the ship, which had anchored 1½ miles to the north of the bay, and, embarking the Commandant, took him on board to dinner with me, having the gratification to pass the first boatload with provisions as we went out.

It appeared that the Russian launch which communicates with *Durąbbin*, the furthest post in the interior, annually, had returned to Michaelowski five days previously, and they, as far as I could understand, had heard of five white people being in the interior; we experienced, however, so much difficulty in understanding one another, that I begged he would put on paper the substance of what he had to communicate, and that I would be able to get it translated at Sitka, whither it was my intention to go, as I thought it desirable that the Governor-General of the Russian Dominions in America should be acquainted with our proceedings, and that it would be a great advantage that Captain Pullen should be

made acquainted with the fact of the *Investigator's* having wintered in the Polar Sea previous to his operations in the ensuing summer.

See Note 18, p. 162.

I was also desirous of seeing the late Governor of Michaelowski, through whom I had no doubt of obtaining such information as would enable me to judge of the practicability of the *Plover* employing part of her crew in attempting to reach the Arctic Ocean by means of the Colville.

Notwithstanding my anxiety to see our party thoroughly equipped, the exposed nature of the anchorage would not permit any time to be trifled with; accordingly at 8.30 we despatched our last boat, and I took my leave of them and the Russian Governor, having acquainted the latter with the proclamation and rewards offered by Her Majesty to any parties who should afford assistance or information of the missing expedition.

*October 13th.*—Immediately the boat returned we weighed and worked to the northward, so as to obtain sufficient offing to weather Stuart's Island, should the breeze blow home; and in the morning were abreast of Egg Island, which is low and flat, but apparently large enough to afford shelter under its lee. The width of the bay being nearly sixty miles, affords a large open space for the sea to rise, and the depth of water shoaling gradually towards the south shore increases the violence of the wave, so that unless a vessel is able to take Tebenkorf Harbour (which one drawing 12 feet can do), or some good holding ground is found between Stuart's Island and the main, Norton Sound must always be an awkward place to resort to. The weather looking well, I ran in again in the forenoon, and sent a boat on shore with some of the officers, to take a last look at their shipmates, and to see if anything in the hurry of disembarkation had been mislaid; but notwithstanding this precaution, we afterwards found a box containing beads and presents was still on board as well as some buffalo robes; but I knew the latter could be supplied by wolf and deer skins, and that the former

could be made good out of the store in the Fort; and perhaps their being obliged to resort there for all the articles they required for barter would prevent any jealousy, that a separate trade (however paltry) might occasion.

The boat returned at 1.30, and reported that they were still in great confusion, but as there was apparently every anxiety on the part of the Russians to make them comfortable, they looked forward with some satisfaction to the prospect before them. We then made sail, leaving them our hearty good wishes, and I rejoiced in the idea that even if the immediate object they had in hand did not succeed, yet that we should on our return be provided with efficient interpreters, and have the means of communicating and dispelling the fears of any parties we might fall in with next year.

*Note:* Mr. Pim.—An account of the remarkable journey of this enterprising officer (who was then serving in H.M.S. *Herald*) will be found in Mr. B. Seemann's *Voyage of H.M.S. Herald to Behring Strait*, 1845–51.

## SECTION V.

### To Sitka.

*October* 15*th.*—Light airs detained us in sight of Besborough Island until the afternoon of the 15th, when at 4 p.m., as we were running to the westward under all sail, a native boat, much to our surprise, made its appearance and endeavoured to come alongside. Not wishing to undergo any delay I did not heave to, but when they had passed it appeared so evident that they were in distress that we immediately shortened sail, and on her coming alongside found that the crew consisted of one man, two women, and a child about two years old. Biscuit they nibbled at and seemed to care but little for, but water they drank greedily, and being then supplied with a piece of raw walrus flesh, they set to work to make a hearty meal. One of the ladies, holding the large piece of walrus flesh between her teeth, cut a piece off it with a knife so close to her lips that, had she not been an adept at the business, she must certainly have cut herself. The morsel from the interior was then handed to the mother of the child, who having somewhat softened it by chewing, gave it to her daughter, and then commenced an attack on the large piece, which was handed from one to the other as fast as a piece was severed. When they had pretty well stuffed themselves, a pipe was offered, which the ladies accepted with great tokens of satisfaction, and strange to say, the mother endeavoured from time to time to induce the little girl to partake of her enjoyment by thrusting the pipe-stem into her mouth. Nature however rebelled, and the infant had too good taste to relish such a luxury.

We then managed to get them on board, and, by means of Captain Washington's vocabulary, contrived to extract from

them that they were tracking along shore in the neighbourhood of Cape Prince of Wales, when the rope broke, and they were unable, through the strength of the wind, to regain the shore and join their companions who were at the track rope. They had been now five days at sea; had not the slightest idea where they were, and could not recognise the land, the nearest to us being Cape Derby, which was 20 miles off, and could only be seen occasionally through the snow-showers. We therefore got them on board, made them comfortable by the galley fire, cleared the *oomiak* of their goods and chattels, and hoisted her in. She proved to be 36 feet long, 6 feet beam, entirely composed of walrus skins tightly drawn over a framework of wood, which was very ingeniously secured by lashings of hide and gut. The boat had no keel and was perfectly flat-floored. The mast had 10 feet hoist with a very long yard, the sail being composed of walrus gut with a patch of an old shirt here and there. The cargo consisted of deer skins sufficient for two if not three tents, together with fishing nets made of sinews, bows, arrows and spears. They soon appeared, through the generosity of some of the officers and ship's company, comfortably clothed after our fashion, the ladies appearing to think the trousers fitted them uncommonly well; and having expressed their satisfaction at the care which had been taken of their things, and stowed some of the most important more carefully away, were located in the sick bay for the night.

*October 16th.*—In the morning we repaired their sail, and found that they were well enough acquainted with the native names and position of the Diomede and King's Islands, together with Grantley Harbour, but had no knowledge of Sledge Island, or *Aziak*, as it is called by the natives.

At 2 p.m. we were within two miles of the shore to the west of Cape Nome, under which we saw a large native encampment, and having drawn a chart and pointed out the route which they were to follow, and that five sleeps would take them back to *King-a-ghee*, we hoisted the *oomiak* out and parted with our guests, having loaded them with

presents enough to make them the envy of the tribe, and decorated the young lady with a copper medal on which was stamped the date and place where they were picked up. Before leaving the ship they did not appear much concerned, but when they had paddled a little distance off, the man stood and rubbed his hand repeatedly over his breast, repeating at the same time some words in which he was joined by the women, and which were no doubt their thanks, As they pulled in for the shore they were met by two *oomiaks*, and having had a conference of about a quarter of an hour, they all made for the village, and we bore away for the south.

After parting with our guests on the 16th, nothing occurred to enliven our passage until the 18th, when, taking advantage of a light wind, we put our trawl over, but were only rewarded by one fish.

At noon on the 20th October, *Oonimak* Island bore S. 29, E. 65 miles, so, taking Captain Beechey's instructions for a guide, we prepared to find our way through the Aleutian Chain into the Pacific Ocean. But before we leave the Sea of Behring for a season, I must say a word or two on the advantage his chart has been to us. The great difficulty a Polar navigator has to contend with is the difficulty of establishing his position by compass bearings, owing not only to the sluggishness of the needle, but the rapid increase of local attraction (the difference of variation with the ship's head east and west amounted to $2\frac{1}{2}$ points when in the neighbourhood of Point Barrow); now by having recourse to the sextant and horizontal angles, with a chart to work upon, on which the prominent peaks are truly placed and the headlands shown with that accuracy that the station pointer can be placed over them, the ship's position is determined with the greatest nicety, and advantage can be taken on passing through ripples or lines of foam to ascertain almost immediately whether the ship has gained or not by getting into a different current. Any person who has commanded a ship and knows the comfort of a good landfall, will readily see that we navigated under fortunate circum-

stances in having the road thus far prepared for us; and besides Captain Beechey's chart we found at the Sandwich Islands a box of tracings from the *Herald*, containing the tracks and discoveries of the *Plover* and that ship with their soundings and drawings of the different headlands. Mr. Woodward was also good enough to undertake the translation of Admiral Lutke's sailing directions for these seas, which we found of great utility.

At 7 p.m., not wishing to get within the influence of the tide, we wore to the westward, and continued standing off and on during the night, until daylight broke on the 21st October at 7, when we caught sight of the high land of *Oonimak* bearing east, and immediately crowded all sail for the straits. As we entered we were more fortunate than Captain Beechey, and caught a glimpse of the high volcano; altogether the scene was a very fine one. *Oonimak*, besides the volcano above mentioned, presented some very remarkable features; steep bluffs standing in strange contrast with numerous conical-shaped hills, some of which were broken down at the sides, showing the craters very distinctly. The mist flying about the higher mountains gave us the impression from below of great elevation, while to the westward the bold black crags of *Coogalga* and *Ooninilaska* were also attracting our attention. Running through at the rate of 8 knots the panorama constantly altered; and as we got into the centre of the strait the deep swell from Behring's Sea gradually diminished, and enabled us so much the more to enjoy the prospect. Although it was the change of the moon, we did not detect any tide races, nor was our run through influenced by more than 0·6 of a knot per hour. At 1 p.m. we opened the remarkable pinnacle rock on the S.W. end of *Oonimak*, and hauling to the eastward got into smooth water with scarcely any surf on the beach; at 2 being in 32 fathoms S., I hove to for a couple of hours to fish, knowing that a change of diet for our men would not only be acceptable but beneficial. Our anticipations of halibut for supper were disappointed, but we got a few cod for our pains.

*October* 22*nd.*—At daylight we were in sight of the Island of *Samnak*, and occasionally during the day saw the high mountain on the peninsula to the north of it.

On the 23rd land was still visible to the north, but indistinct; and on the 24th we had a gale of wind from the N.W., which reduced us to close-reefed topsails for a short time.

On the 26th, after an interval of fine weather, we had another violent breeze, which commencing at west, veered to the south, with a rising barometer; during the forenoon of the 27th, it drew round to the S.E. with the barometer stationary, and eventually settled into a hard gale at east, with a falling barometer on the afternoon of the same day. At 10.30 a.m. in the forenoon of the 28th, after a short lull, it suddenly shifted back again, the barometer still falling; but towards the evening it moderated so far as to permit us to set the close-reefed foretopsail and reefed foresail.

*October* 29*th.*—The barometer rising slowly but steadily, the wind gradually abated during the 29th, leaving us without a breath from 6 p.m. until midnight, when a westerly wind came to our relief, and we were soon under all studding sail, going 8 knots, giving us a fine run for 48 hours.

In the afternoon of the 31st of October it again hauled to the southward, the barometer reaching its highest at midnight, 30·15, the lowest being 28·66 at noon on the 28th, or 84 hours previous.

*November* 1*st.*—At 4.15 a.m., being by our reckoning well in with the shore, we hove to until daylight, and at 6, bore up, catching a glimpse of the land through the haze, which effectually obscured the tops of the hills, and prevented our recognising the land. Having run on till I had satisfied myself we were not in Sitka Bay, we were compelled to stand off until we should be enabled to fix our position, either by the sun or the land showing. This we were not able to do until the morning watch, when, getting a star latitude, we bore up with some confidence, and soon had the satisfaction to see the mists roll away, and discover that (perhaps) most

beautiful of all landmarks, Mount Edgcumbe. At noon the Cape bore S. 86° W., and soon after getting sight of the lighthouse at Sitka, we hoisted the Pilot Jack. Knowing by experience the difficulty of getting into the harbour, I was very glad to see two *kayaks*, paddled by two men, each with a centre hole for a passenger, one of which was occupied, coming out. They were soon alongside, when it became apparent why two were required to carry one person; for, laying their paddles across, they formed a steady platform, and enabled the pilot to effect his release, and get up our side. They are so ticklish in the water, that it is almost impossible for a person to get out; but at the same time they are not only remarkably swift, but also very safe in a seaway, and often put out when boats dare not venture. The pilot told us that the Governor had ordered the steam-boat out to our aid, and she soon making her appearance, towed us up through the middle entrance to the lower part of the harbour, where we anchored at a quarter-past 4, and were compelled to remain until the tide would admit of our crossing the ledge. It was some satisfaction to find ourselves in smooth water inside, instead of beating about among the rocks and shoals which abound in this bay. The long swell which rolls home to the bottom of it, combined with the violent squalls, which frequently take a vessel flat aback, must always render the place difficult of access.

## At Sitka.

On landing, I was immediately conducted to the Governor, to whom I stated the object which had induced me to call at Sitka, and my anxiety to obtain some refreshment for our crew. He at once ordered a supply of rice, calavances, potatoes and butter to be sent on board; but I learned with regret, that the salmon fishing having failed this year, we could not expect a supply of what I had hoped to obtain in abundance. Deer might occasionally be purchased from the Indians in the market, and some canoes with potatoes were daily expected. As for fresh beef, there only four bullocks

in the colony, but a vessel was daily expected from *Kodiak*, and she most likely would bring some, when he would do all he could to supply our wants.

Our arrival, I found, had occasioned great disappointment, as the annual vessel from the north, with a valuable collection of furs, had not yet arrived, although the period of her usual return was long passed; and being in great fear for her safety, our appearance in the morning was hailed as that of the expected vessel.

In the course of the evening, the late Governor, Captain Tebenkorf, came in. He had been relieved by Captain Rosenberg a short time previous, and was now anxiously awaiting the arriving of the northern ship, in order to return to Europe by way of Cape Horn. His detention, however, proved very fortunate for me, as he had been employed the greater portion of his life in these seas, and was the officer who had originally selected Michaelowski as a trading post, and consequently was well acquainted with the country, and kindly assented to afford me all the information in his power. I had also the pleasure to renew my acquaintance with Mrs. Rosenberg, who was here when I visited the place in the *Sulphur*, thirteen years previously. The Governor very kindly promised to send the steam vessel in the morning to tow us up to the Fort, and I took my leave much gratified with the kind reception I had met with.

As I returned on board, I called alongside the Hudson Bay Company's steam vessel *Beaver*, Captain Dodd. She had put in here to undergo some repairs, and I was glad to learn that by her I should have an early opportunity of communicating with Sir George Simpson.

*November 3rd.*—This morning we were visited by the Commandant of the Fort, to whom I explained my inability to salute the Russian flag, as our guns only amounted to two; and at 12.30 the steam vessel took us in tow, and brought us up abreast of the settlement, where we made fast to a buoy. The *Beaver*, on our arrival, saluted the Queen's pendant. The Governor very kindly waited dinner for me, and at his table I met eight or ten of the Russian officers, and spent a very

agreeable evening. All appeared to take a very great interest in our proceedings, and to be desirous of affording all the assistance in their power. We had most pressing invitations to dinner every day at 1 o'clock, when the principal officers assemble, and meet the Governor in a very handsome suite of rooms, set apart for that purpose in Government House. Intimacy was immediately established among the officers notwithstanding the difficul y of communication.

The long period we had been at sea had worn out a great portion of our running rigging, and I gladly availed myself of the dockyard instead of having recourse to our whale lines, which we should have been compelled to reeve, had we not obtained a supply of rope. The Governor ordered one of his four bullocks to be killed for our use; permitted us to make a selection of such spars and planks as we required, and take what firewood we pleased. Not doubting but that we should pay for all we received, I made my demands without reserve; but on the day of settlement I found that he would not permit anything to be charged that was the produce of the colony, and only accepted payment for such articles as had been imported from Europe. It is impossible to say enough in favour of the kindness and hospitality we received on every hand; it left an impression which I am sure will never be effaced from the memory of any officer in the *Enterprise*.

Captain Tebenkorf also showed me all the charts and discoveries which had recently been made under his administration; and in a most handsome manner presented me, for the use of the expedition, with a map of the Russian dominions both in Asia and America, which he had just completed, and had engraved at Sitka.

By his aid, as well as that of the Governor (both these officers having been employed in exploring expeditions on the western side of Behring's Sea), I was enabled to obtain a correct impression of the situation of the Russian posts in the interior.

Captain Rosenberg, I found, in anticipation that some assistance would be required by the expeditions in search of the *Erebus* and *Terror*, had directed that eighteen natives of

the Aleutian Islands and twenty *kayaks* should be assembled in readiness to proceed to the north; and pointed out the advantage these men possess over Europeans, in speaking a dialect of the same language, and living upon the same food as the Esquimaux. Besides being good hunters, and armed with muskets, they manage these *kayaks* with such dexterity that the principal portions of the researches of the Russians to the north had been carried on through their means. I therefore gladly availed myself of his offer, and begged that that he would order them to be sent to the north by the annual vessel in the spring, where they would be required to reinforce the *Plover's* crew, should it be deemed necessary to send that vessel to sea, and at the same time require a party to take charge of the house and provisions in Grantley Harbour; or, should it be practicable to reach the Polar Sea by the route Lieutenant Barnard was investigating, to form a portion of that expedition.

I also received some very useful information from Captain Dodd of the *Beaver*. The Hudson Bay Company, it appeared, pay annually a tribute of 2000 beaver skins to the Russian Company for permission to trade among the islands fronting the coast, as far north as the line of demarcation between the two countries. The *Beaver*, besides supplying the different posts, and collecting the furs, trades herself, and performs two or three voyages every year, going as far north as the Lynn Channel. Here Captain Dodd had on two occasions received letters from Mr. Campbell of the Mackenzie River district, who, by advancing up one of its western tributaries, had established himself on the fork of a large river, and was given to understand by the natives that another of the Mackenzie gentlemen, Mr. McMurray, was located on the same stream, ten days' journey below him. Combining this information with that of Lieutenant Sagoskin, an officer of the Russian Navy, who ascended the *Kwipak* from Michaelowski, and with the reports of white men having been seen on the river above them, it became evident to Captain Tebenkorf that the two rivers were identical. In this opinion I perfectly agreed, and proceed to give what may be con-

sidered rather as the results of his investigation, but expressed in my own language.

Lieutenant Sagoskin's report was published in two volumes, accompanied by a map, at St. Petersburg, in the year 1848, and is entitled, "*Survey of Part of the Russian Dominions in America in* 1842, 1843, 1844."

The *Kwipak* (now the *Yucon*) empties itself into Behring Sea through five mouths, all of which are shoal, and extend from latitude 62° to 63° 25′ N.

The branch ascended by Lieutenant Sagoskin, and the one at present used by the Russians in their communication with the interior, is the northern, from whence the river trends to the S.E. 120 miles; and in latitude 61° 50′, and longitude 162° 45′, the southern mouth separates from the main branch, which is here two miles wide. It then turns to the N.N.E. 240 miles, where it is joined by a tributary from the north. *Nulato* or *Durabbin* (the furthest Russian post in the interior) is situated on the right bank of the river, fifteen miles below the junction of this branch, and is in latitude 64° 42′ N., and longitude 158° W. This portion of the river is called by the natives *Yuk-hana.* The launch, following its windings and ascending against the stream, is usually thirty-five days in reaching *Durabbin* from Michaelowski; but the post can be reached in five days from a small establishment in Norton Sound, opposite to Besborough Island, and this is the route usually taken during the winter, dogs and sledges being used.

The main branch of the river, 15 miles above *Durabbin,* pursues an easterly course; Lieutenant Sagoskin's personal examination terminated at *Koggoia,* in latitude 65° 35′ N., and longitude 158° 40′ W.; but the examination has been further carried on, by subordinate officers, and a large lake reached, in latitude 66° 10′ and longitude 148° W.; from thence, according to native information, it pursues an easterly direction for another 180 miles; and here on the left bank of the river, in latitude 65° 30′ N., and just to the east of the boundary line of the Russian territory, Captain Tebenkorf has placed a Hudson Bay post, which there is little doubt

is the one established by Mr. McMurray, who has reached the *Yuk-hana*, by ascending the Porcupine* branch of the Mackenzie; and it is also probable that he is to the west of the boundary line. The river then pursues a course to the southward of east, passing through two lakes; until in latitude 66° N. and longitude 136° 30′, we arrive at the junction of the Pelly Fork and Lewis River. Here Mr. Campbell, ascending by the Peel River from the Mackenzie, has established himself, and by means of the natives has entered into a communication with Captain Dodd on board the *Beaver* in the Lynn Channel. The latter kindly permitted me to make a copy of a chart, which the natives who brought the letter drew for him; by which it appears, that on a river emptying itself into the west branch of the Lynn Channel there is a native town called *Chilcat*. By ascending this river and a short portage, the whole journey occupying seven days, they reach a lake called *Korosack*, from whence issue the head waters of the Lewis River (eventually the *Yuk-hana* and *Kwipak*); descending which, in two days they reach the *Chutartsze* Lake, from whence, by the river to Mr. Campbell's post they are five days. The return to *Chilcat*, owing to the swiftness of the river, is always made a route overland, to the westward, and occupies fifty days.

Mr. Campbell, in his letter to Capt. Dodd, estimates his latitude as 62° and longitude 136°, but I am inclined to think that Captain Tebenkorf's position, given above, is more likely to be true.

The main point I arrive at is, that the Colville and *You-con*, or *Yuk-hana*, are not identical, and that the former being thus deprived of two-thirds of its watershed, will not afford so ready an access to the Arctic Ocean; whether, however, the Esquimaux ascend it, and communicate with *Durabbin*, will be ascertained by Lieutenant Barnard. I am more inclined to think that the Esquimaux portion of the trade reaches that post by the Buckland River natives and the northern branch of the *Yuk-hana*, as it was from these people that Captain Moore first obtained information of

* The *Porcupine* is now known to be a branch of the *Yucon*.

white men having been seen in the interior; and by his account, several of the Esquimaux from the northward, instead of resorting to Michaelowski, carry on a barter with the Buckland River people at Hotham Inlet annually.

On the 8th November, we swung the ship to ascertain the local attraction of the compasses, and being a day behind the Russian calendar, we omitted the 9th, so as to make our Sunday agree with that of the garrison.

The governor honoured us with a grand entertainment on the 10th, upwards of forty officers being assembled for the purpose. On Her Majesty's health being drank, the fort saluted with thirty-one guns. The same compliment was then paid to the Emperor, and the governor then proposed "Success to the expeditions in search of Sir J. Franklin," taking the opportunity to express that he was not only ordered by the Emperor, and authorised by the company, to afford all the aid in his power, yet he also felt assured that it was the feeling not only of himself, but every person under his command, to do their utmost to promote the success of our undertaking. The fort then fired another salute of twenty-one guns.

Having completed our water, and incurred a debt of gratitude almost impossible to repay, we were ready for sea on Tuesday, but did not eventually get away until Thursday morning. The day previous to our sailing a brig hove in sight, but owing to bad weather the steam vessel could not take her in tow, and she was compelled to go to sea again. We had, however, the satisfaction to leave our kind friends with the great cause of their anxiety removed, as she proved to be the missing vessel. The news acted like an electric shock throughout the garrison. All had either friends or relatives in the vessel, and those bound home knew that the period of their departure was at hand.

*November* 14th.—The steam vessel took us in tow at 8 a.m., the governor and all the officers coming on board to take their leave; and we parted with so strong an impression, not only of the attention which had been shown in supplying our wants, but also of the personal kindness we had received,

that I am sure the recollection of it will remain for ever engraven on our memories. Nor was the governor's generosity confined to the officers, but the ship's company, besides the bullocks, received a quantity of rice, calavances* and butter, as well as a ton of potatoes, which enabled me, notwithstanding the long time we had been at sea, to look upon the passage across the Pacific without fear of scurvy.

The Indians have lost a great many of their native habits, and becoming more civilised, are rapidly losing that bold and fearless character which rendered the greatest caution necessary when entering into an intercourse with them. They are, however, still confined to the beach north of the fort, and opposite the village an old vessel with a formidable row of carronades is still moored, in order to assist the guns of the garrison should they prove unruly. The huts are miserable affairs and abominably dirty, yet one or two boasted windows, and occasional articles of furniture. The hideous lip ornament has almost entirely disappeared, and the hunting coat of skin given way to a dirty blanket, which deprives the savage of his outward characteristic, and at once proclaims the superiority of the white man. Occasionally sixty or seventy canoes arrive with furs for barter, and there are still a good many furs collected in the neighbourhood. The half-breeds are now numerous, and have proved themselves useful artizans. One, in particular, has perfected himself not only in the management but also the construction of the steam-engine, and is now head engineer to the establishment. In the cathedral, also, I was shown some paintings executed by them, evincing not only considerable skill, but ability.

The buildings of the settlement, being composed entirely of wood, soon acquire a dinginess from the constant rain, so that it loses much of its picturesque appearance from the sea on a closer inspection. Besides the new Government House, which was in progress on my last visit, a new cathedral and jetty have been built. The houses are spacious and comfortable, but being fitted with double windows and

* A kind of bean.

warmed by stoves, there is a want of ventilation, to which I am inclined to attribute the great mortality which has taken place among the children. The incessant rain renders out-of-door exercise almost impracticable; in fact there are no walks except the public garden, which is tastefully laid out; but nothing will flourish here apparently, notwithstanding all the care bestowed upon it, except the fir, which grows in a most luxurious manner, clothing the steep sides of the surrounding hills to their very summit, while every little rock or islet boasts of its clump of trees. On a former occasion I had thought it the most picturesque place I had ever seen; it has all charms of a fjord, with the grandeur of Alpine scenery. The peaks outvie those of Rio Janeiro in their rugged outline, and like them, are clothed with a forest to their summit. The most extraordinary thing is that there is no soil, the incessant rains and abrupt declivity of the mountains have left nothing but pebbles behind; all attempts at clearing or cultivation have failed; and the garrison are as completely isolated by the forest as if they were on an island.

The establishment, besides the governor, who is usually a captain in the Navy, consists of two or three lieutenants, besides other naval officers, who having married in the colony, have resigned their commissions in the Imperial Service, and taken situations under the company. These, as occasion requires, take command of the different vessels by which the governor maintains the communication with Kodiak, the northern ports, and the Sea of Okhotsk, where they receive their communications from St. Petersburg, while others are sent occasionally to the Sandwich Islands and California; and an attempt was made this year to open a trade with the northern ports of China. Annually a vessel belonging to the company leaves Russia early in the spring, laden with flour and stores; and having called in the Thames for the principal portion of their hardware and trading articles, reaches Sitka in the autumn; and then embarking the furs that had been collected during the previous year, returns by the same route, viz., Cape Horn.

We had an opportunity of seeing part of the cargo ready for embarkation, and feasted our eyes on silver fox, sea otter, and other rich furs, the amazing value of which surprised us.

Among the suite attached to the governor was a medical officer of the Imperial Guards, who had recently returned from an inspection of the Aleutian Islands, and an officer of Engineers, who was occupied on a mineralogical survey of the country. From the latter we obtained a very favourable testimony as to the quantity of gold ore in British Columbia.

The lieutenant-governor of the Russian Dominions in America resides at *Kodiak*, and there, although to the northward of Sitka, the climate being more favourable, and the soil in some measure adapted, potatoes and other vegetables are raised; and they have besides 200 head of cattle.

NOTE.—The whole of the Russian territories in North-West America, including the Aleutian Islands, were sold to the United States in 1867 for the sum of seven million dollars.—[ED.]

## SECTION VI.

### To Hong Kong.

*November 14th.*—We went to sea by the southern passage; and the steam vessel having towed us out into the middle of the bay, we availed ourselves of a fair wind, and sent her back with our kind wishes and recollections to those who had so hospitably treated us.

We soon experienced the long swell of the Pacific—

> Mobilitate viget, viresque acquirit eundo
> Parva metu primo;

but the wind being from the E.S.E., enabled us fortunately to obtain an offing; it speedily freshened into a gale, and reduced us to storm sails by 3 p.m. In shortening sail we lost our mizen topmast and Bentinck boom, thus having occasion immediately for the use of the spars so kindly furnished us. 8 p.m. found us under main trysail and reefed foresail, standing to the southward, with a very heavy cross sea.

On the morning of the 15th of November at 5.30 the wind suddenly shifted to the southward and fell light, but again drawing to the eastward we tacked at midnight. The weather proved squally the next day, shifting to the westward at noon, but eventually settling in the south quarter. Rainy squally weather reduced us again to main trysail and fore staysail on the 17th, and an uneasy cross sea carried away our life-buoy; immediately after noon the wind fell, but we had scarcely got sail made when it again freshened so rapidly as to give us great difficulty in getting the sail off her quick enough.

During the 18th of November the wind remained pretty

steady from the S.E. quarter, but blowing in furious gusts at times; the barometer fell to 28·36 at 8 p.m.; the following morning it was not so violent, and at 4 p.m. fell calm; the barometer indicating 28·20, did not give us much hopes of a quiet night, and a breeze shortly after sprung up from the S.W.; we, however, came off better than we had expected, experiencing during the 20th some glimpses of fine weather; and the sea going down, we had the satisfaction before night of finding that she was making way to the southward at the rate of 7 knots per hour. On the 21st the wind deserted us at 2 a.m., but sprung up from the west at 8, to which we gladly spread our studsails; towards night it freshened, and we congratulated ourselves that the morning would find us to the southward of the 50th degree of latitude.

*November 22nd.*—We had a capital run of 185 miles on the logboard at noon, and getting somewhat better weather, set to work to repair our damages; fortunately we had obtained a supply of cordage at Sitka, otherwise we should have been compelled to have recourse to our whale-lines for running gear, the constant wear and tear of the last ten months and the heavy weather we had recently experienced leaving us scarcely a trustworthy rope.

The wind continuing favourable, we made 160 miles on the 23rd of November, and it enabled us in the intervals between the passing showers to dry our clothes; during the forenoon of the 24th it fell light and drew round to the north, but settling in the afternoon at S.E.; on the 25th it tacked round to the S. and S.W. with squalls and foggy weather, and we were glad to take advantage of Silvester's stove to warm and air the ship, which proved on this occasion a great comfort after the continued wet weather.

*November 27th.*—To-day, taking advantage of the wind being light from the west, I swung the ship for local attraction, and as on examination we found the head of the fore topmast sprung, that occupied us during the afternoon.

By observation on the 30th we found the southerly wind had produced a difference between our reckoning and observation of fifty miles in three days.

On the 4th of December at 9 a.m. we were caught in a heavy squall attended with thunder and lightning; this, however, had the effect of clearing the atmosphere, and although much pestered with squalls, we obtained after this period more settled weather; but we did not finally clear this tempestuous climate until we reached to the southward of the 30th parallel. Certainly, during the fall of the year, this north-west coast of America is worse to navigate, as far as the wear of the hull and rigging is concerned, than either Cape Horn or the Cape of Good Hope. The weather appears never settled; you have scarce got sail made on the ship when the squalls return with a violence which renders it necessary to shorten again immediately; and then they are accompanied by so much wet weather that it is extremely harassing to the people. This showed itself very plainly by increasing the number of our sick to nine previous to the 8th. On the 7th we took advantage of a calm to shift our main topmast; the hounds having given way, were no doubt the cause of the loss of our fore topmast. The precaution, therefore, was now adopted of inserting solid Africa oak cheeks; but I also think our topmasts were too taunt for their diameter.

*December 7th.*—The wind continuing to hold to the westward prevented our progress in that direction. I, therefore, had (reluctantly) to give up the idea which I had formed of touching at the Bonin Islands, in order to see what supplies we might reckon upon there on our voyage northerly next year, and to seek some place where we might obtain change of diet and water. Unable to get further westerly without entering the tropics, I made up my mind to put into one of the Sandwich Islands; and knowing from a former visit that the island of *Atooi* would suit us well, I determined on putting in there. *Hanalae* Bay was, I knew, open to the northerly swell, which visits these islands at this season; but I hoped to complete our water and lay in a stock of fresh provisions sufficient to ensure our health without risk; accordingly we held our way to the southward without caring for our westing as we had done hitherto.

*December 17th.*—We made *Atooi* at daylight on the 17th, but owing to light winds and currents did not reach our port until the 22nd. On entering we were boarded by the pilot (Kellett), who had been settled here by the late consul, Mr. Charlton, and who was here when I visited the place in 1837.* He was uncommonly glad to see us, being much in want of medical assistance, and had some difficulty in getting on board; but undertook to put us in a good berth, where, with ground tackle such as we had got, we need not fear the rollers. In working in we passed under the stern of the only vessel in the bay, which, with the same feeling a man would recognise an old friend, I found to be the *Starling*,* bringing back at once to my recollection many a hard day's work on the Pacific and on the coast of China; and though now sold out of the service, and condemned to potatoe droguing, I rejoiced to meet with her.

## Hanalae Bay.

Having picked up a good berth in 6½ fathoms, I went on shore, and found Mr. Charlton's house occupied by Mr. Dudois and his family, who were old acquaintances, and immediately set to work to supply our wants; so that we obtained at once the fresh beef and vegetables we were in need of. The latter, notwithstanding the extraordinary richness of the soil, were somewhat scarce, owing to the demand from California, and also that the population of these islands has been drained so far, that there is scarcely any one left to cultivate the soil, and consequently many sugar and coffee plantations, after being brought to perfection, are now abandoned for want of manual labour to check the growth of weeds and collect the crop.

On the 23rd of December we commenced watering and refitting our rigging, shifting our fore-topsail yard, which was sprung, and getting aloft a new fore-topgallant mast made from a Sitka spar. In the evening a small vessel, junk-rigged, arrived from Honolulu.

* See Memoir.

I was awoke during the middle watch with that curious sensation that something was going wrong, and finding a swell was setting into the bay, I got on deck as fast as I could; it was perfectly calm, but the rollers had begun to thunder on the reef, a long swell occasionally finding its way across, and lifting the ship with the surge. We got a kedge into the cutter with a view of dropping a second anchor clear of the one already down, but before this was done it became evident the ship was driving; being prepared, the second anchor was at once let go, and we brought up within a half a cable's length of our former berth, but still less under the protection of the reef, and rather too close to the junk. On heaving in the S. B. (Porters) we found the shank gone, a clean break, showing the goodness of the hold, and at the same time the value of that which will give before it does go. We then let go the sheet, veering to 50 fathoms on one and 25 on the other, awaiting the result with no small anxiety, as it became evident the sea would break alongside; and got our fourth anchor ready for what might happen. The undertow, however, as the swell increased, caused us to ride broadside to, and by taking the precaution of having a few inches slack chain constantly before the stoppers, the serious effect of any sudden jerk was prevented.

Although an anxious time, one could not but admire the magnificence of the overtop; at times it broke in the centre of the bay in 11 fathoms of water, at others rolled on to the beach and broke with a crash that seemed to shake the very island to its foundations. The junk lost her boat (by the painter breaking), which drifted along to the westward seldom within the curl of the surf, and when we at last made it out had even made some progress to seaward. Four or five times the sea broke alongside; I think the ice sponsons saved us not only from shipping a considerable quantity of water, but also caused us to rise when the upright face of the sea appeared to render it impossible.

On Christmas morning, the swell having in a great measure abated, we warped as near as possible into our former berth

and moored, and in the afternoon turned our people on shore for a run after their long cruise. As we had altered our time at Sitka, we were a day in advance of the good people here, and I would willingly have given them a second Christmas Day, particularly as they had only had half a one; but being uncommonly anxious to get our water complete before another batch of rollers set in I could not afford it; we, therefore, made their holiday a working day. The junk, lying with a long scope of cable, was carried under our bows on the morning of the 27th, and before we could get her clear, our jibboom carried away her mizen-mast.

The northern anchor having come home, I sighted it, and hauled a little closer to the reef. The boats, laden with water, had some difficulty in crossing the bar.

On Sunday morning the swell began again to rise, rapidly increasing after noon, so much so that we lost the opportunity of hoisting our third whale boat either up or in, and the sea curling alongside, turned her over; as she was well made fast, I thought there was no fear of losing her, but a sudden jerk parted both cable and painter, and we had the vexation to trace her career along the edge of the surf until dark, without the hope of ever seeing her again.

One of the most extraordinary instances of sudden death that ever came to my knowledge occurred this evening between 9 o'clock and midnight. On endeavouring to call William Luxford (the quartermaster of the middle watch) at 12, he was found quite dead in his hammock. I saw him in perfectly sound health after 6 p.m., when he came from aloft, having been sent up to keep an eye on the whale boat as long as possible; and the men who slept on either side of him both agree that he went to sleep about 9 o'clock, without saying that anything was the matter with him; and being in the prime of life, in excellent health, it appears almost surprising that nature had not made effort sufficient to awake those who were berthed alongside of him. Such, however, is sometimes the Almighty's will to snatch away suddenly those that appear most strong. The surgeon had been detained on shore by the surf, but as it moderated

during the middle watch, the senior lieutenant managed to get on shore and bring him off; I do not think he could have saved his life had he been on the spot when the melancholy fact was discovered, as the body was quite cold and no animation whatever perceptible.

*December* 30*th*.—The ship having during the last rollers again brought her anchors together, we had again to remoor, and in the evening consigned the body of our late shipmate to its last resting place, lamenting the loss of one who by his conduct and general demeanour had gained the approbation of his officers and the good-will of all on board.

On the 31st we embarked six head of live cattle, and completed our water; waiting but a land breeze to carry us out from a place where, although we had received every attention and kindness, yet we were but too glad to get away from. The *Starling* and the junk by dint of towing and sweeping managed to get to sea; by the latter I took the opportunity of communicating with our Consul, General Millar, and transmitting our despatches.

*January* 1*st*, 1851.—The first morning of the year brought with it no breeze to help us, and deeming the *Enterprise* too heavy to tow with our own boats unless in smooth water, we had no alternative but to remain; and being desirous our men should have a good opportunity of washing their clothes and bedding, I turned them all on shore on the beach, and gave leave to some of the officers, with the understanding that it was my intention to go to sea immediately a breeze sprung up. I also went on shore to bid Mr. Dudois and his family farewell, and again to thank them for their kind attention. From the cliff we watched the sea breeze gradually making its way to the shore, though it did not reach the bay until 1 p.m.; but no one answered the signal for sea until 4 p.m., when having picked up some of the stragglers, and leaving the gig to bring off the senior lieutenant, surgeon, and clerk in charge, I weighed, and we got out to sea, standing in to pick them up at 5.30. Now, however, our breeze failed us, and the long rolling swell indicated a fourth series of rollers, which would have placed us in a critical

situation. Fortunately light catspaws helped us, and we evidently drew off shore, though but slowly.

After midnight we got an air from the S.E., which as we receded from the land gradually increased towards morning, and relieved me from the anxiety of a week.

HANALAE BAY is, however, a very excellent port, except during the three months of December, January, and February; and even during those periods might be made comparatively secure for four or five vessels by placing anchors on the reef, so as to enable vessels to haul in as close to it as the depth of water will admit. The land on the west side of the bay rises very abruptly, leaving scarce any passage between the high cliffs and the sea; the plain gradually increases in width, and the mountainous land recedes from the coast immediately to the east of the bay, leaving a luxuriant plain, through which the river finds its way, entering the sea near the eastern corner of the bay. Although the entrance is difficult for a boat at low water by reason of the coral reef, there is a depth of 3½ fathoms inside, which might be reached by locks, a method preferable in my opinion to the proposal of deepening the channel by narrowing the entrance; this latter plan is liable to the objection that no stones would ever remain on the reef exposed to such a surf as we saw, and that the silt from the river, instead of spreading over the bar as it now does, would be deposited in the only place where vessels can now lie with anything like safety during the winter months.

At the entrance the land rises immediately on the right bank of the river, forming an elevated plateau 80 or 100 feet above the sea; on the top of this cliff, with a commanding view of the bay and a beautiful prospect of the river and the plain below, is Mr. Dudois' house. The dismantled Russian fort lies on a headland commanding the bay a little further to the northward. On the same side of the river and higher up is a coffee plantation belonging to Mr. Rhodes, from whom also we received a great deal of attention. On the opposite side Mr. Vanderkemp was located, both however being sadly distressed for want of labourers. The mission

establishment and Kanaka village are situate more in the centre of the bay.

In my passage across the Pacific I determined to run at all the numerous dangers in our route, knowing well that numbers of them had been laid down by ships without chronometers, and that this portion of the Pacific Ocean still remains in a great measure a *mare incognitum*. On the 5th January we passed within vision of the alleged position of Malloons Island without seeing any indication of it, and on the 14th ran over the southern position of the Lee Rocks at 8 o'clock in the evening without seeing anything of them. When in lat. 17° 40′ N., and long. 190° 42′ W., we began daily to see boatswains, tropic birds, and boobies; and on the 25th passed within sight, but without seeing, another reef laid down on the chart, in 17° 55′ N., and 203° 48′ W. On the 29th January at 3 p.m. we got sight of the northern islands of the Ladrone Group, and at midnight passed six miles to the south of Almaguan. I should have preferred running down the 20th instead of the 18th parallel, but at this season of the year I could not have ensured the trade wind so far to the north. We then hauled to the north, crossing the 20th degree of latitude in 221° W., and passing within sight, but not seeing, the rocks laid down by Captain Bishop in 1796. On the afternoon of the same day, 4th February, we were abreast of the dangerous shoal reported by Captain Douglas in 1789, whose position agrees pretty well with ours, viz.:—

| | | | | | |
|---|---|---|---|---|---|
| Douglas | 1785 | Latitude | 20° 36′ N. | Longitude | 223° 48′ W. |
| *Enterprise* | 1851 | „ | 20° 26′ N. | „ | 223° 57′ W. |

We could not make out anything above water; the breakers appeared from the mast-head to form an ellipse five miles from north to south, and three from east to west. On the 7th we passed the assigned position of Abreojos in 21° 58′ N., and 230° 44′ W.; but although we opened our eyes, we could see nothing of it. Sighting Little Tobago Xima at 2.15 p.m. on the 9th, and shaping a course to pass to the southward of Vele Rete, at daylight the next morning we had a glimpse

of the high land of Formosa, and hauled to the northward, knowing well the value of keeping to windward of my port during the N.E. monsoon on the coast of China.

We made the mainland at daylight on the 13th February, where I found myself quite at home; passing to the north of Pedro Bronca at noon the next day, and not liking the look of the night, I hauled up and anchored under Tooneang, notwithstanding the urgent entreaties of a Chinese pilot, who kept dodging under our stern, with "Captain can go Hong Kong to-night." I thought myself the better pilot of the two, and the night verified my apprehensions, coming on thick and squally at midnight. The following morning at daybreak we were under weigh and narrowly escaped being set into Mirs Bay by the indraft. A Chinese fisherman kindly gave us warning of the Ninepin Reef, not knowing we were capable of close-shaving it; and after running through the Lyeemoon, came to in Hong Kong at 9.15 a.m., having since we left Plymouth on the 20th January gone over a distance of 35,225 miles, traversed the Atlantic Ocean from 49° N. latitude to 52° S., the Pacific and Behring's Sea from 53° S. to 73° N., and circumnavigated two-thirds of the globe, being 343 days at sea and 48 at an anchor. I had the satisfaction, notwithstanding our long voyage, to find my people in excellent health, there being only two officers and one seaman on the sick list, and the general remark was that our men looked much fresher and more healthy than those belonging to the ships of the station, which I attribute mainly, under the favour of God, to the excellence of our provisions and the excitement which an expedition of this description must always cause. However, it gave me great confidence with regard to our future operations.

### Arrive at Hong Kong.

*February 15th.*—We found the *Cleopatra* and *Reynard* lying here and the *Royalist* on the slip, Captain Bate having had surveyor's luck and got on a coral bank while exploring the coast of Palawan, and was only extricated from

a very critical position by great energy and hard labour. Having a nephew on board her, besides Captain Bate being acquainted with my friends, I had the satisfaction of receiving news from home, which, although of a melancholy nature, relieved me from that harassing anxiety which a return to civilised life always produces until allayed by intelligence from those that are near and dear to you. As it was only at the last moment, when I found I could be of no use this season to the northward, that I had selected this place (which appeared most preferable for many reasons), as the spot where we would recruit our ship's company and replenish our stores, it was impossible to have pre-arranged it. The *Herald* I found had left for England six weeks previous; not finding us here or seeing us during his stay, Captain Kellett had come to the conclusion that I had found a wintering place at Point Barrow. The trip to Sitka had not entered my head when we parted, and he expected that I should find my way straight down from Behring's Sea; and as he had to call at the Sandwich Islands for his charts, he fully expected that we should have been here first. He brought, however, some boxes of balloons which had been prepared subsequent to our leaving England, and sent to the Sandwich Islands by way of Panama. Having given up the idea that we should come to Hong Kong, he had left directions that they should be sent back to General Millar, in order that they might be forwarded during the ensuing season by the whalers to the *Plover;* fortunately no opportunity had occurred, and we took possession of them.

Having paid my respects to Sir George Bonham and the authorities, and renewed my acquaintance with many old friends, I set about our refit, and with Captain Massie's assistance, soon got everything in train. A good deal, however, required to be done, for not only had the period of our being at sea been longer than usually falls to the lot nowadays of H.M. ships, but we were fitted out with the worn sails and rigging of the former expedition, and therefore the ship might be looked upon in this respect as being two years in commission. There being no sails suited for us in

store, we had mainsail, topsail, jib, driver, and topgallant sails to make. The *Minden*, however, proved an excellent sail loft, and took a portion of our crew away from the ship while she was caulking. On examining our holds we found some of the heads of our beef casks started. I had them all examined at the cooperage, when the meat, which was especially prepared for our use at Deptford, was found to be in excellent condition, requiring only the addition of a little pickle: our casks being stowed with coal in bulk, this proved both a troublesome and dirty operation.

I had then our contracts for oil, candles, pickles, etc., to enter into; these things more especially devolving on me in consequence of the illness of the second master and clerk in charge. The six weeks, however, proved quite sufficient, not only for all our purposes, but also enabled us to give our men plenty of the shore.

On the 22nd February I assisted at the installation of Sir G. Bonham as a K.C.B.; on the 27th the *Cleopatra* and *Reynard* sailed, the former for Manila, the latter to try her screw and rate of sailing. Lady Bonham left the same day in the Peninsular and Oriental Company's steamship *Malta*, the climate of China having, I regret to say, caused a sad inroad upon her health.

Finding the coal from the dockyard not so well suited for our stores as the Formosa coal, we got a junk alongside from Killon, and took in 14 tons, paying about the same price for it as is paid in London for the best coal. The *Cleopatra* returned on the 20th March, bringing for us 2400 lbs. of tobacco, which we required to replace what had been supplied to the *Plover* and used by ourselves.

As the period of our departure drew nigh we swung the ship to ascertain the amount of local attraction on the 27th of March. The French frigate *Capricieuse* arrived the same day, and in Commodore Roquemaurel I found an officer much interested in our object, having served himself in the recent Antarctic expedition. The *Achilles* with the mails arrived on the 29th, and brought answers to our despatches forwarded from Port Clarence by the *Herald*, and thus

enabled us to receive late intelligence from our friends at home.

Having by Captain Massie's assistance been thoroughly equipped and restored for three years, I have also to express my acknowledgments for the assistance I received from the heads of the different departments, all of whom appeared anxious to afford all the aid in their power to our undertaking; we embarked eight live oxen with fodder for thirty days. I was in hopes that the *Royalist* would have been ready to sail at the same time, in which case we intended to have kept company as far as the Pratas Shoal; but her repairs were not yet completed, and as I thought the monsoon fairly established, and I had informed their Lordships of my intention to leave on the 1st of April, we had nothing to detain us; so, taking a farewell of civilised life for a season, we started on the morning of the 2nd.

## LEAVE HONG KONG FOR THE NORTH.

Unfortunately, notwithstanding aid from the *Cleopatra's* boats, we fouled an American brig and did some damage to her mainsail as well as carrying away our flying boom. We drifted slowly down, not passing Green Island until noon, when we got a fine breeze from the southward, and at 1 I parted from my friend Bate, with those feelings which can only be experienced by those who have been companions in trying circumstances, and who were each about to embark on a hazardous and arduous voyage: he to run the risks of the coral banks in the Palawan Passage, and exposure to fever and ague in a tropical climate, while we had to undergo the rigour of a Polar winter, and the chance of the scurvy. Both, however, looked forward with a reliance on that Power which had so often shielded us.[10a]

[10a] Commander W. T. Bate served with Captain Collinson in the Chinese War, 1840–42: *see* Memoir. After the *Enterprise* had left Hong Kong the captain found written on one of the deck beams of his cabin by Bate, "NUMBERS vi. 24, 25, 26": these are the words of the solemn blessing which the Almighty instructed Moses to give to the people of Israel. And that inscription was still on the beam when the *Enterprise* arrived at Sheerness in 1855.

*April 2nd.*—Working to windward between Lamma and Hong Kong, we reached the west end of Pootooy Island by 6 o'clock, and passed the first and middle watch in Lema Channel; the weather being thick, we had not only to look out for land, but to keep clear also of the Chinese fishing-boats, which are usually trawling in this neighbourhood. The first tack we made after dark, no one being by the lee main topgallant brace, we lost the yard. At 4 a.m. it cleared somewhat, and getting hold of the north end of the Grand Lema, we got out to sea.

On the afternoon of the 4th April, the wind gradually freshened from the north-east, showing that the monsoon was not done yet, and shortly reduced us to double-reefed topsails and reefed courses: the uneasy sea being very distressing to our cattle, besides destroying a large portion of our fodder. On the 6th, in the forenoon, we came suddenly into smooth water, and found by its discoloured appearance that we were under the lee of the Pratas Shoal, and passed about 1½ mile to the south-west of the breakers. Several small land birds, driven from the reef no doubt by the gale, flew on board. The wind moderating the next day, but still continuing to the northward and eastward, led me to fear we should be driven over to the coast of Leuconia [? Luzon]. It, however, nearly failed us altogether, and we made but little progress, only getting through the Bashee Channel on the 12th April. Our fodder beginning to grow short, I began to think of putting into Madgicosimah Group or else Napakiang; however, by stowing our bottles in oakum, we collected a little straw; and went on in hopes the monsoon would come at last; fortunately a strong northerly set aided our progress. It was, however, vexatious to see the hot weather making such havoc among our potatoes, and notwithstanding constant attention in airing them, we lost a great many; in order to pass through a tropical climate, they require to be packed in small quantities, and the cases so arranged that the air can get freely at them.

On the 20th April, we passed Raza Island, leaving it about six leagues to the eastward; not being laid down

upon the chart we were navigating by, I was not aware of its vicinity, until too late either to verify its position or to endeavour to have got some food for our live stock. Getting a fine breeze from the south-east, we passed between Amsterdam Island and the one laid down to the south-east of it; going within three miles of the latter and within a mile of the position of a rock laid down by Captain Bishop in 1796, without seeing either.

I took advantage of the fine weather to employ our carpenters in fitting up lockers upon the lower deck for our men's clothes; at present it was much encumbered by their large chests, which both hindered the ventilation and prevented the deck thoroughly drying.

A fine breeze sprung up on the morning of the 26th of April, which, continuing for the next forty-eight hours, relieved my anxiety concerning our live stock, which I began to fear we should not be able to carry up to the ice with us; but making Bailey Island at 2 a.m. on the morning of the 28th, we bore away for Port Lloyd. At daylight, and even for some time afterwards, we had a difficulty in making out exactly where we were. The *Blossom* having made the port from the north, we could not for some time reconcile Captain Beechey's description of the land; but running along outside the islets which lay off the south end of Peel Island, we soon made out the three peaks at the back of the harbour, and the high cliff on the south side as you enter. Still we were at a loss for the remarkable islet on the northern side, which is described as the principal landmark; being, however, under the cliffs from the direction we approached, it did not appear conspicuous. As we drew in, a canoe under sail crossed our bows, the sole occupant of which was soon on board. He had but small clothing, and less English, but managed, however, to let us know that his name was Harry, that he was a pilot, and that he had pigs, turtle, yams and onions for sale. So putting ourselves under his guidance, we ran in, without, however, seeing the coral patch on the south side, to which we must have given a close shave, and succeeded in getting to an anchorage without much difficulty. It is, however, an

awkward place for a heavy ship to enter, in consequence of the deepness of the water, the steepness of the coral banks, and the sudden flaws of wind, which are sometimes very violent. Our cattle were soon revelling in all the luxury of a cabbage-palm.

Captain Beechey's voyage in the *Blossom* having called public attention to these islands, and their importance as a place of resort for the whale ships employed in the Japanese seas being early seen, Mr. Charlton, our Consul at the Sandwich Islands, equipped an expedition for the purpose of establishing a settlement on them in 1831. Four of these original settlers still remained on our arrival, and from one of these (Chapin) I got the following account, which I copy nearly verbatim, as it gives both a useful and interesting account of the establishment.

### Bonin Islands.

The season for planting at the Bonin Islands is in the months of March and April. Ships calling at these islands can procure whatever supplies they may want of potatoes, yams, onions, pumpkins, pigs, goats, fowls, and fish, at any season, and green turtle from February to August inclusive. Wood and water are easily to be procured at any time. The turtle begin to lay their eggs in May, and continue to lay until August; after that time they leave the isles, the males departing five or six weeks before the females. The latter lay from 200 to 400 eggs each, according to their age, and at two different layings. The price of supplies are:

| | |
|---|---|
| Yams, $2 per barrel. | *Potatoes the same.* |
| Onions, $4 per barrel. | *Pumpkins, $10 per hundred.* |
| Corn, $1 per bushel. | Turtle, $2 each. |
| Goats, $2 each. | Hogs and pigs according to size. |

The settlers have put hogs, goats, and deer on some of the other islands, and they are increasing rapidly. The best anchorage is at Port Lloyd, in about 24 fathoms of water.

The prevailing winds from April to October are from N.E. to S.E. with generally fine weather; and from November to

March inclusive, from N.W. to S.W. The strongest gales are in May and November, and always begin at S.E.; they blow hard for about four hours from that direction, and chop suddenly round to the westward and die away, but they do not come regularly; sometimes for three or four years there are none in these months. In December, January, and February there are gales from W. to N.W., but not very heavy. There is in the harbour, a short distance from the anchorage, a very convenient place to heave a vessel down for repairs, and also a sand-bank to lay a vessel on shore if necessary. There have been, since the settlers have been on the islands, two ships and one schooner that have landed their cargoes and repaired here, and one Russian man-of-war was hove down here before the settlers came.

Since the isle has been settled (about twenty-one years), there have been born on the isle twenty-six children, of which twenty-one were boys and five girls; twelve children have died, ten boys and two girls; and also eight male adults and six females. Some of the men have been left here sick from the ships; the greater part of the boys, all but four, are gone away on board different ships; and two of the girls are gone to Oahu for their education.

August 3rd, 1837, arrived H.M.S. *Raleigh*, 16 guns, Captain Quin, five weeks from Macao; and on December 23rd, 1838, arrived H.M.S. *Larne*, 18 guns, Captain Blake, forty-five days from Macao, bound to the Isle of Ascension, one of the Caroline Islands; August 9th, 1849, arrived the schooner *Louisa*, Captain Hadley, and the cutter *Maid of Australia*, Captain Young, from Hong-kong; and on August 11th, arrived the China-built vessel (junk) *Saint Andrew*, Captain Barker, from Hong-kong, as commander of the whole; they recruited, and all sailed again August 29th. On September 21st, the junk, Captain Barker, and the cutter, Captain Young, returned (the schooner having gone on), having had bad weather, and the junk having broke her rudder, and both wanting repairs and provisions; the settlers on the island gave them every assistance in their power, and fitted them for sea. After they were ready, they first commenced plundering

the natives of their live stock, salt provisions, oil, etc. They then commenced plundering the whites; they robbed Mr. Savory of about $2000 in cash, and about $2000 in live stock, salt provision, stores, oil, clothing, medicine chests, canvas, etc.; in fact, all they could get hold of; what they did not want they broke and destroyed, Mr. Savory being obliged to secrete himself in the bush, for fear they would take his life. They also robbed Mr. Millichamp of his live stock, salt meat, stores, money, etc., and a large quantity of clothing; in fact, they robbed all the settlers of whatever they could.

A French whale ship, the *Nile*, arrived while they were here, and nine of her men left her; Captain Barker furnished them with arms to defend themselves, and prevent the French captain and officers from taking them; and after the ship had sailed he received them all on board. On some of the settlers remonstrating with Captain Young, of the cutter, concerning the robberies, he said he did not care what his people did, and did not care if they left the settlers with only a shirt and trousers. They took away Mr. Savory's wife and also one other female with them; and on January 9th, 1850, the junk and the cutter sailed for San Francisco.

On July 20th arrived the brigantine *Vanguard*, from Hong-kong, Captain Richards, bound to Stewart's Island for Bêche de Mer. On the 4th of August she sailed; and after she got outside, the captain in the night sent the boat on shore armed, and they stole one female from off the beach, and carried her away in the vessel. We understood their intention was to get two more females, and carry them to Stewart's Isle, and dispose of them to the chiefs there for Bêche de Mer, as females are in great demand there. We understood that the boat's crew was to have a reward of $20 a head for whatever females they might get and bring on board. The same night they bore away.

The tides rise four feet at these islands; it is high water at 6 o'clock at full and change.

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Having met with Captain Hadley (of the *Louisa* above mentioned), who, greatly to his credit, endeavoured to have

Captain Barker arrested for the above atrocity at Hanalae Bay, I was in some measure prepared for the story, and had written to General Millar to say that I would have the depositions of the parties taken and forwarded to him, so that these miscreants might not go unpunished. I found that the U.S. brig *Dolphin*, Captain Page, had called here in September for the express purpose of obtaining evidence on the subject, and which, I hope, will lead to the offenders being punished. Mr. Savory, now an old man, still felt his loss deeply, but most of all his wife, who was a young girl born on the island; she, however, it appears, was a good riddance, for by all accounts she gave information as to where his money and valuables were hid, and departed nothing loth.

The cliffs in many places round the harbour came so close to the beach as to leave no cultivateable ground between them and the sea; but where valleys occur they have all been turned to account, with the exception of one on the west side of the inner harbour, which has probably been left vacant as a careening and repairing place for vessels. Beginning at the head of the harbour, on the eastern side is the establishment of Mr. Savory, which yet showed signs of the wantonness of Commodore Barker and his crew. One could not help sorrowing to see the old man thus robbed of the fruits of his industry, and the comforts he had laid by for his old age. On the same side of the harbour, abreast our anchorage, James Moitley, an old man-of-war's man, was located, and here we watered; the stream, however, being so far from the beach as to require all the length of our watering hose. Below Moitley and opposite the entrance of the harbour was a long beach, occupied by the natives of Oahu, and here the deserters from the whale ships had taken refuge. At the southern end of the harbour, and just inside the high cliff, is the flagstaff, and the settlement of the principal person charged by Mr. Charlton with the colony; he was and had been absent some time, and the house and grounds were in charge of John Newheavn. This is a very convenient situation, as it has the advantage of

a narrow isthmus of sand, over which canoes can be hauled, thus affording a convenient communication both with the harbour and the sea; and there is more level ground in this vicinity. Outside the harbour, in a bay to the southward of the isthmus, was the establishment of our pilot Harry Bolla. On the west side of the harbour, immediately after you enter, is a long beach, within which Bravo, Webb, and Cullins had their plantations. We were soon boarded by the different parties, and having made our arrangements to take something from all, so that the whole community might benefit by our visit, we set to work completing our water, cutting grass, and taking in firewood. With our seine we were at first unsuccessful; but by taking the proper time of tide, and watching the shoals, we soon caught more mullet than we could consume. On the 2nd of May I went to one of the islands outside, goat-shooting, but having been far from well since leaving Hong-kong, I was soon overcome by the heat. Some of the officers afterwards succeeded in getting two or three, which proved capital eating; they are quite wild, and cause an amazing deal of fatigue not only to follow but to get at.

Chapin informed me that there are five men and two women on Bailey Islands to the southward; there is no anchorage among them, but ships sometimes stand off and on, while their boats obtain water and refreshment. Webb also mentioned that since he has been on the island (five years) he has twice seen the harbour covered with pumice stone; no doubt caused by an eruption from Sulphur Island. The turtle, no doubt, are fast diminishing; they still, however, form the staple article of food, being salted down for the winter's consumption.

Having laid in a good stock of fodder for our remaining five head of cattle, completed our stock of pigs to thirty-five, and embarked twenty turtle, besides as many potatoes, yams, and onions as we could stow, some of which we hoped to carry up to the *Plover*, we were ready for sea on the morning of the 5th of May, but owing to light airs did not start until next day. Then, being well content with the

nature and extent of our supplies, we bade the settlers farewell. I furnished them with a Union Jack and some ball cartridge, strongly advising them to show some confidence, and stick by one another, in the event of Commodore Barker, or any other marauder, visiting them in future; but if they did not work together, and allowed one bay after another to be robbed, they would all suffer in detail. I also had the gratification of increasing Mr. Chapin's library, which I have little doubt affords the old patriarch some gratification, and may possibly be useful to the rising generation.

## SECTION VII.

### To Port Clarence—Behring Strait.

*May 6th.*—We succeeded in clearing the harbour without difficulty, and finding the wind from the northward outside, ran round the south end of the island; at daylight the following morning part of the group were still in sight. On the 8th we finished pickling our onions, making in all 626 lbs., which I hoped would prove equal to those we had obtained at Hong-kong, and superior to what we had brought from England. The latter being stowed in casks instead of jars had suffered by our transit through the tropics. We had a heavy swell from the N.E. to-day, and passed in the afternoon a large spar, apparently part of a lower mast. Our Bonin Island pigs proved a quarrelsome set, fighting and biting one another, while the Chinese were much quieter and better behaved.

*May 11th.*—A falling barometer and increasing wind showed that the swell experienced yesterday was the forerunner of a gale of wind; and by 3 p.m. we were under close-reefed main topsail, main trysail, and fore staysail; at 8.30 a sudden shift of wind took place and brought the ship's head to the sea, in which she made so deep a plunge as to sweep away jib and flying jibbooms, carrying the fore topmast and maintop-gallantmast with them; it required the greater part of the night to clear our wreck away and save what we could. The weather moderated something on the 12th, and we gradually made sail, setting the close-reefed fore topsail on the stump of the mast. Still a heavy sea remained, and our topmast crosstrees being broken, it was not until the 15th that we were able to shift our mast. In the meantime our live stock suffered, and we lost a pig and

turtle, being also under the necessity of killing one of our bullocks. The bad weather continued with little intermission until the 20th, the heavy sea staving our whale-boats, and carrying our wheel ropes away twice. The temperature falling, and having so much wet weather, induced us to clear the square of our main hatchway, and get at Sylvester's stove, which when lighted soon made us more comfortable below. The weather being cold enough to ensure our beef keeping, we killed two more of our cattle on the 22nd; and passing to the westward of *Attu*, entered Behring Sea on the 23rd of May. Immediately after passing the Aleutian chain the bad weather left us, but we still experienced the northerly set. Many sea birds and a few land birds were seen. At first we made very fair progress, but the 31st of May arrived before we reached the 61st degree of latitude; and then being in longitude 180, I again changed our date, so as to accord with the reckoning from the westward. In the afternoon of our first Saturday, May 31st, we exchanged colours with an American and French whale ship; on our second Saturday, May 31st, several sail were about us, and in the afternoon we sighted the ice; at 10 p.m. tacked off the edge of a close pack. During Sunday forenoon we spoke the *Champion*, of New Bedford; the ice had made an awkward impression on her cutwater. In the afternoon, the wind being light, the captains of two French (*Ajax* and *Manche*), and the American whaler *Armata*, came on board. From them I learnt that there were upwards of a hundred sail at the edge of the ice, which was much lower down this season than the last; that there was no land water yet either on the American or the Asiatic side. On this information I determined to work up into the head of the bight we were now in, and then to enter the pack, little doubting but that by this time there must be a considerable quantity of land water in the head of the Gulf of Anadyr. This I thought would forward us more than crossing to the American coast and waiting for an opening. Captain Holt, of the *Armata*, on hearing my intention, said: "If I had a bow like yours, sir, I wouldn't stick at nothing; but these cutwaters of ours won't

stand the ice anyhow." Coming on board the next day, and hearing the loss of our spars, he kindly offered to furnish us with a flying jibboom, and would accept no payment. I gladly accepted his offer, as we could not afford to sacrifice either of our hand masts for this purpose, and we had no other spar long enough. At midnight we were in the head of the bight in two-thirds ice and one-third water. Throughout the 3rd we still made progress, and early on the 4th of June got into more open water, but found the horizon bounded by ice, except to the N.N.W. During the forenoon we again spoke the *Champion*, and gave him information of a dead whale we had passed in the middle watch. At 5 p.m., after rounding a point of ice, we bore up to the eastward, and made way until midnight, when we were set fast, and remained closely beset until 6 a.m., when the ice opening somewhat we forged through it under all sail. At 1.30 p.m., being again beset, we commenced watering, and by 6 p.m. got in 8 tons, when the ice slackened, and we cast off, making half a knot per hour. During the first part of the 6th of June we made very fair way, working amongst loose ice, but in the afternoon it became more heavy and close; great numbers of seal were seen on the ice, and being of a species new to us, we were very anxious to procure a specimen; but although several were wounded they all contrived to make their escape, until the middle watch on the morning of the 7th of June, when we at last succeeded in shooting one dead. They proved to be a hair seal, curiously marked with narrow circles of white round the neck and tail and each flipper; the latter meeting in the back gave them the appearance of being cross-belted (like a soldier) while swimming. We had little or no wind till the afternoon, when a south-easterly breeze sprang up, and enabled us to push to the N.E. until 4 the next morning, when, although the wind was 4 (moderate), and all canvas spread, the ship would not move one inch. We had, however, reached lat. 64° 28′, and had 50 fathoms water, muddy bottom. We remained closely beset all the 9th, and our fodder being exhausted, were under the necessity of killing our last two cattle. I

had hoped to have taken them up to Port Clarence alive, where there is excellent pasture, and Captain Moore could have kept them until winter set in. The cold had so great an effect upon our turtle that we were also under the necessity of killing them to save their lives.

In the afternoon an experiment with the blasting cartridges was tried upon the ice; being, however, filled with very coarse gunpowder, the heat they had been exposed to in the tropics had completely destroyed them.

See Note 34, Appendix.—GUNPOWDER IN ICE.

The thickness of the ice alongside was 18 feet, being formed of four and sometimes five layers; generally speaking it was very dirty as if it had been in contact with the land.

See Note 13, p. 143.—STONES IN ICE.

## ANADYR GULF.

*June 9th.*—

At noon the current set E.N.E. (true) 0·5 per hour.
At 8 p.m. „ „ „ „ 0·6 „ „
At midnight „ „ „ „ 0·25 „ „

Fifty-two fathoms water, muddy bottom.

*June 10th.*—At 7.30 a.m. we got sight of the land, and ice beginning to open a little, gave us some hopes of finding open water in that direction, but which we could see nothing of from the crow's nest; being calm we could make no progress, and when a light air from the north sprung up we were again beset. At noon we had 53 fathoms mud.

The current set E.N.E. (true) 0·3 per hour. Cape Behring bore N. 32′ E. 29 miles.

The following morning there was an appearance of water to the southward, but about us the ice remained close. At noon we had no current, but had evidently closed the land, the soundings being 40 fathoms. In the afternoon we made a little progress to the N.E., boring through heavy ice. On the 12th at first we had but half ice, half water, but soon were closely beset again, and at noon had 34 fathoms,

Cape Behring bearing N. 21′ E. 22 miles. The set of the current was as follows:—

*June* 12*th*.—At noon E. (true) 0·35 per hour.
At 3 p.m. N.N.W. (true) 0·4 per hour.
At 8 p.m. none.
At midnight E. (true) 0·4 per hour.

The ice appeared slack to the southward the next morning, but towards the land not a drop of water was to be seen, which was no great encouragement. Still I felt the current must eventually bring us out to Cape Tchutskoi. The whaling fleet, however, by this time might be sailing up on the opposite side, and our detention was provoking.

At 2 a.m. the current set N.N.W. (true), scarcely perceptible.
At noon „ „ E. by ½ S. „ 0·6 per hour.

Cape Behring bore north, and we were in 32 fathoms water.

We remained fast until afternoon on the 14th; the current, however, in the meantime had assisted us, and Cape Behring bore N. 25′ W. true; by dint of warps we made a little start, and while thus employed were much surprised by the appearance of five *baidars* carrying ten men each; by following the narrow lanes of water and launching across floes, they were soon alongside, but their voyage must have been attended with great labour, as Cape Atcheune (the nearest land) was eight miles distant and the ice towards it appeared very close. "Tawac" was evidently the great object of their visit, and having each been presented with a small quantity, a barter for walrus teeth, etc., quickly ensued. They had evidently been in frequent connection with the whale ships last year; and on some of the walrus teeth the whole process of a whale's capture by Europeans was rudely carved. The men differed considerably from the natives of America we had seen last year, being stouter made and altogether a sturdier-looking race; the face squarer, broader across the forehead, no labrits or holes bored through the cheeks for them. After remaining three hours on board they left us for the shore.

*June* 15*th.*—During the forenoon of the next day we made a little progress, but we were closely beset during the afternoon.

The current set at noon N.N.W. (true) 0·25 per hour.
„ „ „ 4 p.m. E. „ 0·13 „ „

We were in 33 fathoms gr., Cape Atcheune bearing N. 43′ E. 10 miles.

*June* 16*th.*—Throughout the whole of the 16th we remained immovable, and in the afternoon experienced considerable pressure. Being desirous of unshipping the rudder, I tried the effect on the ice with Bickford's fuse and five pounds of gunpowder; repeating the experiment a second time nearer the ship, with two pounds of powder, we accomplished our object; but on unshipping the rudder found that the sudden jar had broke our lower rudder pintle.

See Note 34, Appendix.

The 17th June was principally spent (the ship remaining closely beset) in endeavouring to get the broken pintle out of the gudgeon, but it resisted all our contrivances; we were therefore under the necessity of taking the new pintle off, and as the brace was of no use, but added to the weight, we removed that also.

We still moved slowly to the eastward, making now a little southing. Cape Spanberg bore at noon N. 87′ E. 16 miles.

Finding our progress still obstructed by the close condition of the ice, we tried some more experiments with powder on the ice, but at last came to the conclusion that it might do very well to remove a tongue or slight obstruction, but the general effect here was to bring more ice to the surface by separating the layers; how it would answer in a solid field we had yet to see.

*June* 18*th.*—*Cape Aulachpene* at noon bore N. 84′ E. 29 miles, and we were in 37 fathoms, dark sand and mud. At night three *baidars* came off; we found they used bone runners for transporting their *baidars* across the ice. Having been regaled with some tobacco, they remained on

board and took some rest after their labour. We had, however, the misfortune to lose Mr. Whitehead, clerk-in-charge, during the middle watch, and I was but too glad to get them away from the ship. He had been suffering for a considerable time from rheumatism, which had almost rendered him a cripple, and was scarcely able to do any duty all the time we were at Hong-kong; previous, however, to our departure from there he rallied considerably, and a medical consultation on his case being held, they arrived at the conclusion that he was in a fit state to go, with which I was very well pleased, as having served in the ship under Sir James Ross, his experience would have been of value, and I had also every reason to be well pleased with the manner in which he had discharged his duty. It was, therefore, with very melancholy feelings that we bore his body across the floe and committed it to the deep.

We made a little way to the eastward, and early on the 20th four *baidars* came off. We soon found that they knew the *Plover* and some of the officers' names. At noon Cape Tchutskoi bore N. 64′ E. 25 miles. We were evidently among looser ice and got a distant glimpse of St. Lawrence. At 8.30 p.m. the ice closing, and being unable to turn to windward, we furled sails and made fast to a floe, and were visited by a party of natives from Port Providence, who soon showed that the *Plover* had passed the winter of 1848 among them, as they knew the names of all the officers. They were of course especially well treated, and received several presents as tokens that their kindness to our countrymen had not been forgotten. Towards morning, June 21st, the wind drew from the north and we cast off, giving the natives to understand that we should see the *Plover* in a few days. By noon we were abreast of Cape Tchutskoi, and had a fine view of the land and the entrance into Port Providence, which from an excellent sketch supplied by the *Herald* we could easily identify. What, however, gladdened us more was the dark blue line trending along the coast to the northward, assuring us that our long hoped-for land water was in sight at last. The afternoon being very clear, we could

make out several sail under the Island of St. Lawrence; they appeared hampered, however, by the ice, being under easy sail standing to and fro. Three native boats came off at night, and being calm we made fast to a sconce.

*June 22nd.*—A light air from W.S.W. enabled us soon to make sail again; and at 3.40 a.m. we had the satisfaction to emerge into open water, and find the ship once more yielding to the impulse of her canvas without the obstruction which had tantalised us nearly three weeks. We had a good look at the entrance of Port Dundas, and I hove to for a short time out of compassion to a *baidar*, the owners of which were paddling might and main to get up with us. We were going 5 knots again, and it was quite a pleasure to watch the ripple from her bow. In the afternoon we got again amongst some heavy floes, and a thick fog coming on, were compelled to make fast an hour before midnight. At 6 a.m. the fog lifting, we made sail, but soon found our progress obstructed by the ice; however, both King Island and Cape Prince of Wales were in sight, and therefore I determined to push across to the American side at once, instead of keeping in the land water to the westward. The floes, however, proved much larger (some being six to eight miles in circumference) than any we had yet met with, and the ice occasionally totally obstructed our progress.

*June 25th.*—At noon on the 25th King Island bore S. 65 E., the current setting N. 0·2 per hour, and the depth of water being 28 fathoms, grey sand. The ice being slack, we made some little advance on the 26th by working and warping out of one hole into another; and had by noon got well up with the Diomede Islands, being in lat. 65° 12′ N., and long. 190° 54′ E. The afternoon being clear, we had both continents in sight; that to the westward was very distinctly reflected in the clouds.

We did not succeed in making so much way on the 27th, and at 6 p.m. being overtaken by a fog, which did not permit us to see our way from hole to hole, were compelled to make fast, and found the current setting to the N.W. 0·6 per hour, and we were in 20 fathoms dark sand.

At 7 a.m. it cleared somewhat, and enabled us to move, giving us also a glimpse of the Fair Way Rock, bearing N.E. by N. 5 miles. The wind failing in the afternoon, we clewed our sails up, and commenced warping to the eastward, as I began to fear the northerly set might carry us too close or between the Diomedes. At night we saw three sail to the N.E.

*June 29th.*—We continued warping all night, and succeeded in clearing Krusenstern Island without experiencing any pressure, having a mile to spare; the ice was, however, thrown up on the beach with great violence. Two native boats came off from the islands, in which were natives of both continents; we could not make out to which side the islands belong, but they are no doubt a favourite haunt for the walrus fishery. At 6 p.m. we secured to a floe, being in 29 fathoms, dark sand.

The current set as follows:—

| | | |
|---|---|---|
| 8 p.m. | N. by E. (true) | 1·2 per hour. |
| Midnight | „ „ | 1·0 „ |
| 4 a.m. | N. „ | 0·8 „ |

*June 30th.*—At 5 we cast off and recommenced our labour of working and warping to the eastward, and at 6 p.m. were rewarded by getting into open water on the American shore; but having been set considerably to the north of Cape Prince of Wales, commenced working to the southward between the ice and the land.

*July 1st.*—The wind remaining southerly, we made but small progress during the 1st against the southerly current; and the bank laid down by Captain Beechey narrowed our channel, and kept us out in the stream. It shoals rapidly, but the least water we had was $4\frac{3}{4}$ fathoms. The *Investigator*, I learnt, had been pooped, and shipped a good deal of water on it last year.

On the morning of the 2nd we saw two sail to the southward; and at noon Cape Prince of Wales bore S. 4′ W. 18 miles, and the wind drawing to the westward, we were enabled to lay along the land. At 3.30 p.m. the captain of

the *Nancy*, of Havre, came on board. He had got the ship on shore during the fog on the low point of Cape Prince of Wales, and not thinking the ice yet sufficiently open to follow his vocation, determined to accompany us into Port Clarence, in which he was joined by his consort, the *Lagoda*, the latter having also received some damage about the cut-water, by the pack coming in upon her while at anchor. As we were rounding Cape Prince of Wales, several *oomiaks* were seen going to and fro, from *King-a-ghee* to the edge of the ice, walrus-fishing. One or two forsook their occupation and visited us, when, much to our gratification, we recognised one of the women we had picked up in Norton Sound; she was no less pleased, and soon made herself quite at home. Keeping the shore aboard, we ran along under Cape York; and at 3 a.m., July 3rd, had the gratification to exchange numbers with the *Plover* in Grantley Harbour.

## PORT CLARENCE.

Captain Moore was soon on board, but I found he had painful intelligence to communicate, and when we got below I had the great grief to hear that Lieutenant Barnard had been cut off by the Indians.

It appears that he remained at Michaelowski until the close of the year, when, taking advantage of the return of the Governor of Durabbin (the post in the interior), he accompanied him, leaving Mr. Adams and Thomas Cousins at Michaelowski. On his route he wrote two letters from Kaliska (a small station in Norton Sound opposite to Besborough Island), dated the 1st and 3rd of January, acquainting Captain Moore with his proceedings, and the favourable disposition of the natives, from whom he had received a report of a vessel being wrecked in the neighbourhood of Point Barrow. On the 25th of February Mr. Adams at Michaelowski received a note from him, with the information that he was dangerously wounded, and that the post had been attacked by the Indians. Mr. Adams immediately

started for the interior, but before he reached *Durabbin* Lieutenant Barnard had died of his wounds.

It appears that on their arrival at *Durabbin* the Governor sent out two men on a trading expedition to the northern branch of the *Yukhana* (or *Yukon*); these men never returned, and rumours reached the post that they had been cut off. This, however, appeared to occasion no alarm, and the post was neither stockaded, nor does it appear they even took the precaution of securing the doors of the houses. The establishment consisted of two separate dwelling places, with a cooking shed between them; one being appropriated to the Governor, in which Lieutenant Barnard was lodged, and the other constituted the barracks of the men. The Governor, on going out of his house early on the morning of the 15th of February, was suddenly set upon and instantly murdered by a party of Indians, who then rushed inside and opened the door of the room in which Lieutenant Barnard and the interpreter were then sleeping, and his bed being unfortunately opposite the door, they must immediately have set upon, and most likely severely wounded him before he was able to make any resistance. A powerful struggle then took place, his double-barrelled gun being found broken in the stock; and the interpreter aiding him, they managed to clear the house, and the Indians (the alarm having been given in the barracks by a woman who from the cook-house witnessed the murder of the Governor) took to flight; halting, however, to wreak their vengeance on a tribe of friendly natives who were located near the spot, and putting all to death they laid their hands on. The interpreter, who was also wounded, got a boy to carry the intelligence to Michaelowski, and Lieutenant Barnard was just able to write a few lines to Mr. Adams, acquainting him with his condition, and after lingering a few days, expired. The people who perpetrated this atrocity were part of a tribe of Indians on the northern branch of the *Yukhana*, through whom the Russians were in the habit of trading with the Esquimaux of the Buckland River. What occasioned it it is difficult to say; whether it originated in a quarrel with the two traders, and

the Indians, fearing to be called to account for their death, determined to be beforehand, or whether encouraged by the faulty security in which the garrison were living, remains yet to be known. We, alas! had to lament the loss of one who had gained universal esteem, and I had to undergo the painful consciousness that the expedition was deprived of one of its most valuable officers, and one whom I could ill spare.[11]

[11] LIEUT. BARNARD.—The murder of this officer by the Indians was one of the heaviest of all the misfortunes experienced by the *Enterprise*, and, perhaps, the most depressing to its commander. This quite accidental loss of one of his best officers was enough to daunt a less resolute man, as an event ominous of future trouble. He writes to Sir F. Beaufort (the Hydrographer): "I have to lament the loss of an able and intelligent officer, to whose ability and goodness of disposition I had looked forward as one of the main stays of the expedition. . . . These are severe trials which it has pleased Almighty God to inflict—murmur we must not, but steadfastly do our duty, in the fervent hope that He will eventually bless our endeavours."

That part of North America then belonged to Russia; and one of their fur-trading stations was at Michaelowski, in Norton Sound. In the course of the winter 1850-1, Lieut. Barnard went with the annual Russian party to the station of *Nulato* (*Durabbin*) on the *Yucon* River. The Russians were on such good terms with the Indians in those parts, and *Nulato* being not one hundred miles from Michaelowski, the station was unprotected by any palisade. But some cause for a hostile feeling of the natives against the Russians must have existed, for a Russian employé, sent by Barnard to a native village only twenty miles up the *Yucon*, was at once attacked by them and killed, and, immediately, a party of the Indians proceeded to the Russian station and attacked it. Very little defence would have checked them, for they only killed two white people, the Russian chief and Lieut. Barnard, and that was because they got into their house (it being early morning); and then a few shots dispersed them; an extraordinary part of this affair was, that on the evening before, they attacked and burnt another Indian village only one mile from the station.

Such a calamity, totally unexpected by the Russians, could not have been preguarded by the British officers; but it told severely on the subsequent career of the expedition, and must have often come back to the commander's thoughts.—[ED.]

The interpreter (who was well known, having served both in the *Herald* and *Plover*) under Mr. Adams' care recovered of his wounds, but previous to our arrival had died at Michaelowski. Captain Moore early in the spring detached

Lieutenant Cooper and Mr. Bourchier to Michaelowski; the former unfortunately becoming frost-bitten, was compelled to remain at *Kaliska*, where he was joined by Mr. Adams on his return from *Durabbin*. Mr. Bourchier managed to make his way back to the *Plover*, but Lieutenant Cooper and Mr. Adams had only reached that vessel on the 1st inst., having been brought over in the *Plover's* launch, which Captain Moore sent for that purpose as soon as the ice opened.

I had also the mortification to find (nothwithstanding the care taken by Captain Kellett in removing all the men who were likely to be afflicted with scurvy) that the *Plover's* ship's company had suffered severely during the winter, having had no less than eighteen scorbutic cases, and that altogether they had passed a very uncomfortable time, being frequently visited by heavy gales of wind; which I presume will account for the ice being found so much further to the southward this season. On inspecting her people, they appeared at present in very good health, having been living on fish, venison, and ptarmigan the last three months; but it was evident to me, that unless means occurred of changing the greater portion of her crew, another winter could not be passed without very serious consequences. I therefore determined, in case no man-of-war should arrive previous to the close of the season, to send her to the southward, and I came to this conclusion the more readily, because by her having passed two winters on this coast, a good understanding had been established with the Esquimaux; so that I could almost feel assured that any Europeans in distress would be forwarded by their aid along the coast, and maintained until they could reach Michaelowski, where I directed Captain Moore, after making a *cache* in Grantley Harbour, to deposit the greater portion of his provisions. On holding a survey upon her hull, the carpenters also reported that the dry rot had spread so extensively, that in their opinion she was unfit to go among the ice, and therefore the idea of placing her at Point Barrow, where she would have been more useful, had to be abandoned.

*July 4th.*—Mr. Adams and Thomas Cousins rejoined us the next day, neither looking the worse for their winter residence, although they had great discomforts to contend with. The *Nancy* and *Lagoda* followed us into the bay, and the *Sheffield* arrived the same day. The captain of the latter (Roys) was the original person who (reading Captain Beechey's voyage, and seeing mention made of many whales in Behring Sea) led the whale ships up here, and General Millar had told me I should find him a most intelligent person. The whales, it appears, frequent the Asiatic more than the American shore, but they must be nearly all extirpated, as there were nearly 100 sail in these seas last year; and he expected this year there would be more than 150; and by the lastest accounts from the United States, between 300 and 400 sail were fitting out. Last season had been very successful, and all the fleet had returned in safety. This year one ship had been already wrecked upon the Island of St. Lawrence, and a great many were damaged by the ice, which was further to the south in June this year than he had known it before. He also informed me that there was a man-of-war among the fleet; but the description did not agree with the *Amphitrite*, nor was there time yet for that vessel to make her appearance. I therefore took it for granted that it must be a Russian. A schooner also from Hobart Town, laden with potatoes, etc., was in company with the fleet, and had made a very good market; a box of them Captain Roys sent me were in excellent preservation. I was in hopes, therefore, that she would communicate with the *Plover*, as our potatoes being sweet, had not stood the cold so well, and we had but a few left to give her. However, they got onions and pumpkins in addition to fresh beef; the latter, I was given to understand, was not much relished after the venison. I also gave them all our live pigs.

We hauled the seine without much success. Fish, however, was to be bought from the natives, who were busy drying a quantity for their winter store. We found the *Plover* at the mouth of Grantley Harbour; but owing to various circumstances, it was the 8th before she joined us outside, and

then, having completed our despatches, filled up our wood and water, and taken in such provisions from the *Plover's* house as would be useful to us, and having also got four dogs and a sleigh and re-embarked Colonel Colquhoun's cart (which it appeared had proved very useful to them), we were ready for our northern trip. The *Plover* was to go at the same time to Michaelowski, to receive any antiscorbutics the Governor of Sitka might have sent up for her use, and to make arrangements relative to the Aleutian Islanders; after which she was to cross over to the rendezvous on the Asiatic side, and pick up any dispatches that might be forwarded by General Millar through the whalers from the Sandwich Islands; and then proceed northerly, as far as the ice would admit, so as to carry back the latest intelligence, if any was to be obtained from the natives. If on his return to Port Clarence no man-of-war had arrived, so as to exchange a portion of his crew, I directed him to proceed to Hong-kong, depositing a small quantity of provisions in Grantley Harbour, and the remainder in Michaelowski. I chose Hong-kong in preference to the Sandwich Islands for the following reasons:—The repairs she stood in need of could be better made good; that she could be replenished with provisions and stores from our own yard, without the occasion of any man-of-war having to carry them to her; that in consequence of the gold mania no seamen were to be obtained at the Sandwich Islands, to supply the place of those he would be under the necessity of invaliding; that the winter is comparatively cool at Hong-kong to what it is at Honolulu, and that the communication with the Admiralty is more direct.

*Chimuak*, a chief who had been very useful in procuring supplies for the *Plover* during the spring, hearing we were going past *King-a-ghee*, begged hard to be permitted to accompany us in his *oomiak*, being desirous of purchasing walrus blubber, to which of course I agreed; but then came *Kaimoki*, a second chief, with a like request; and as we could not look after two *oomiaks* if it came on to blow, it was settled that he should go with part of his followers.

*July 10th.*—On weighing, however, on the morning of the 10th, *Kaimoki's oomiak* came alongside, and his head man tried to tempt me with all sorts of bribes—otter skins, walrus teeth, etc.—but I was inflexible; and accordingly, having secured *Chimuak's oomiak* to the stern davits under the gig, and taken in *Kaimoki*, Mrs. *Kaimoki* and child, with two attendants, we bade adieu to the *Plover*, leaving them with the expectation of returning to civilized society, instead of spending a fourth winter in these regions; I should have removed a second master and the clerk-in-charge to the *Enterprise*, but I saw the idea of spending two or more winters among the ice was too disheartening. I strongly urged Captain Moore, even if a man-of-war did arrive, to return himself to the south, and recruit his health, which he stood much in need of, but was very adverse to. We were compelled also to discharge into her a marine, James Adams, apparently one of the strongest men in the ship, but who had shown such decided symptoms of pulmonary disease, that it would have been wrong to have taken him with us, and therefore, although greatly to his regret, he was left behind.

NOTE.—*H.M.S. Plover.* This vessel was not destined herself to escape so easily from the Arctic Seas. The captain and crew were relieved in 1852, but the ship under a new captain (Commander R. Maguire), and a new crew, returned to Behring Strait, and remained there on watch until the *Enterprise* came out in 1854; during this period she wintered two seasons at Point Barrow, and collected much information about the Esquimos.

## SECTION VIII.

### To Baring or Banks Island.

### Leave Port Clarence.

Having a beating wind, it was not until the afternoon of the second day that we reached Cape Prince of Wales, and had therefore an opportunity of improving our Esquimaux, and making ourselves better acquainted with our guests; on which occasion Captain Washington's vocabulary was of signal service. The two ladies, for Mrs. *Chimuak* likewise accompanied her husband, behaved very properly; and we should have managed very well, only it requires time to overcome the train oil and fishy smell, together with other peculiarities inherent to these people. They tried to give as little trouble as possible, and appeared to enjoy the trip amazingly. Many presents were made to them, but the most highly prized was the sergeant's red sash, with which *Chimuak* intended to cut a shine among the natives of *King-a-ghee*. On our arrival off the Cape, we were soon surrounded by *oomiaks*; and among others, the man as well as woman we had picked up in Norton Sound came on board. When he recognized the ship, there was no bounds to his gratitude. He gave me a very large walrus tusk, which had evidently been reserved for the occasion, and wanted to give everybody something, even to the clothes off his back. Working close along shore, we had a good view of the settlement, which appeared more extensive than any we had hitherto seen. When we passed before I had taken notice of a large basin, into which we could now distinctly make out a convenient opening, so that in all probability there is a good harbour here. I could not spare time to have the entrance sounded, but having mentioned it to Captain Moore, I have no doubt he will settle the question.

*July 12th.*—On opening the Straits, we found the wind

from the northward, and stood off to the ice, off which we tacked at 9 p.m. Shortly after midnight on the morning of the 12th we got into 4½ fathoms, on the bank off Cape Prince of Wales, and continued working to windward until 7 a.m., when the wind hauling by west round to south, enabled us to make all sail for Point Hope. At 10.40 p.m. we came up to and passed through some streams of ice, amongst which the walrus were very numerous.

Early on the 13th, the ice becoming closer, we hauled to the west, and gained open water; but a fog coming on, and there being some swell, I kept along its edge until 9 a.m., when we again kept away to the eastward. In the afternoon we had a sight of two sail to the westward, apparently standing off and on. At 2 p.m. we again came in sight of the ice, this time stretching across our bows; conceiving that we should have an earlier opportunity of getting through, or turning its edge by entering Kotzebue Sound, we hauled to the eastward, running along its edge. Not seeing water over it, and with the swell then running, I did not like the idea of entering. During the forenoon of the 14th we had the satisfaction to see the pack become more disconnected, and at 11 were enabled to bear up and get between it and the north shore. At noon Cape Krusenstern was in sight, bearing E. by S.

On the 15th of July the wind shifted to the west, compelling us to work to windward between the ice and the land; and we were boarded by a *baidar* from Point Spenser, which had a few loons to dispose of, numerous flocks of which showed us that this neighbourhood is a favourite resort. At 2.45 p.m. being off Point Hope, I sent Lieutenant Phayre to deposit information and examine the *Herald's* post, which had not been disturbed by the natives, a few of whom were now resident on the point, and one *baidar* came off. On the boat's return we rounded the point, but having light and northerly winds made little progress.

*July 16th.*—During the forenoon a *baidar* came off from the Asses' Ears, the owner of which produced a paper from the *Herald*, and acquainted us that the native name for Point Hope is *Noo-na;* his own village, in a bay north of

the Asses' Ears, *Ka-ma-due;* a large village between Cape Dyer and Cape Lisburne, *Woo-ut;* Cape Lisburne, *Tega.*

The afternoon being remarkably fine, I sent Lieutenant Phayre in the cutter, to shoot his way down to Cape Lisburne: loons being numerous around us, and we had found out that they make an excellent kettle mess. During the first watch, three *baidars* came off, anxious to barter birds for tobacco; one of them had a fish or two. In the middle watch the next morning we could hear quite distinctly peal after peal of firearms reverberating from the cliffs, which were distant more than three miles, showing that our shooting party had commenced the work of destruction. At 7, being off Cape Lisburne, two more boats were sent, and we remained standing off and on until 4 p.m., when all parties returned, bringing with them 524 birds. In the meantime several *baidars* came off from *Woo-ut*, whose dialect it appeared differed materially from that of the Esquimaux in Norton Sound. Making all sail to a south-easterly wind, we ran away to the north, passing through several streams of loose ice, on which were many walrus, during the night. Being well in with the land, several *baidars* came off. Not, however, being prepared for a current of forty-five miles, and the land hereabouts being very low without any distinguishing feature, we had no idea until noon that we had reached Icy Cape. Some very heavy masses of ice were aground off it, in 9 fathoms. The wind drawing to the N.E. compelled us to make several tacks, but at 3.30 a.m. on the 19th it came round to the east, and so on to south, enabling us to reach Wainwright Inlet by 8 a.m.; when ten *baidars* came out, and a brisk barter for furs, bows and arrows, etc., began. Tobacco was the great object in request, and it was astonishing how eager they were for it. Coats, trousers, moccasins, in fact anything they possessed, was sacrificed, and it was not unusual to see a man borrowing part of his wife's garments, having disposed of all his own. In one of the boats was almost the only specimen of female beauty I had yet seen. She was very tastefully dressed; the deer-skin frock being ornamented with embroidery, and her hair

braided with a profusion of blue and white beads. We found the ice as we advanced to the north pretty close into the shore off Point Belcher; so I sent the whaler to see if there was water enough for us between it and the land. Lieutenant Phayre returned with an unfavourable report so far as regarded our progress, so we stood off and on, hoping the easterly wind would make a lane for us. Although the wind remained in that direction, the point of ice outside of us turned round towards the land, and our expanse of water gradually became smaller and smaller, until we were fairly beset, in ice much broken up; but by 7 a.m. it was so close that the natives, unable to get their *baidars* to the ship, came to us across the ice.

*July 20th.*—The current ran as follows:—

| | | |
|---|---|---|
| 1 a.m., | N. by E. (true) | 0·5 per hour. |
| Noon, | N.E. by E. „ | 0·9 „ |
| 4 p.m., | N.N.E. „ | 0·4 „ |

At noon Seahorse Islands Point bore S. 63′ E. eight miles. At 4 p.m. the sails being useless, we furled them.

During the 21st July the current ran:—

| | | | |
|---|---|---|---|
| 2 a.m., | 17 fms. of water, | N.E. by N. (true) | 0·6 per hour. |
| 8 a.m., | 18 „ „ | N.N.E. „ | 0·5 „ |
| Noon, | 15½ „ „ | N. „ | 0·6 „ |
| 10 p.m., | | E. „ | 0·4 „ |

The ice slackened somewhat in the afternoon, and we made sail, but with little or no effect.

On the 22nd the current was:—

| | | | |
|---|---|---|---|
| Noon, | 20 fms. of water, | E. (true) | 0·6 per hour. |
| 4 P.M., | 20 „ „ | E. by N. „ | 0·4 „ |
| Midnight, | 20 „ „ | N.E. by E. „ | 0·4 „ |

The ice slackened occasionally, and we continued our efforts whenever it opened, but scarcely moved the ship out of her dock.

During the 23rd of July it kept closing gradually, until it was evident the ship was undergoing great pressure. On examination we found her to be lifted upwards of an inch.

The current set as follows:—

| | | |
|---|---|---|
| 4 a.m., E. by N. | (true) | 0.7 per hour. |
| Noon, N.E. by E. | „ | 0·3 „ |
| 4 p.m., N.E. by E. ½ E. | „ | 0·5 „ |
| Midnight, E.N.E. | „ | 0·6 „ |

We had the satisfaction clearly to make out a blue water-line between us and the shore, which was six miles distant. At 11 p.m., a party of natives came to us across the ice from their *baidars*, and we could make out numerous tents along the cliffs. They called Refuge Inlet *Noo-na-boo*, or *Il-lip-se*, and the inlet south of it, *Too-na-mut*.

On the 24th of July the current was:—

| | | |
|---|---|---|
| At 2 a.m., E. by S. | (true) | 0·6 per hour. |
| At noon, S.E. | „ | 0·5 „ |
| At 4 p.m., E. | „ | 0·5 „ |
| At 8 p.m., N.N.E. | „ | 0·5 „ |
| At midnight, N. | „ | 0·5 „ |

Several natives came on board, and at the turn of the tide the ice slackened so much that I had great hopes of reaching the land water, from which we were not above three miles distant, but we made scarce any progress. In the afternoon we had another party on board, one of whom drew a kind of chart, on which he portrayed the two streams between Refuge Inlet and Cape Smyth, calling the northern one *Oo-fe-la*. Between the two streams, by his representation, which he verified by appealing to men from the other *baidars*, were thirteen tents; between the northern one and Cape Smyth there were six, and five more on Cape Smyth, which he called *Noo-oo*. The name given me by Captain Moore for Point Barrow is *Noo-a-tok*.

We gradually closed the shore on the 25th, until 6 a.m., when we were two and a half miles from it, and within a mile of the land-water, the ice loosened a little, and the ship's head turned to the S.E.

*July 25th.*—The following is the set of the current:—

| | | | |
|---|---|---|---|
| 2 a.m., 16 fms. of water, | E. | (true) | 0·8 per hour. |
| 8 a.m., 25 „ | „ N.N.W. | „ | 1·3 „ |

| | | | |
|---|---|---|---|
| Noon . . . | N.E. by E. | (true) | 1·8 per hour. |
| 2 p.m. . . . | E.N.E. | „ | 1·3 „ |
| 6 p.m., 14½ (sand) | N.E. by E. | „ | 2·1 „ |
| 10 p.m. 13 „ | E.N.E. | „ | 1·3 „ |
| Midnight. . . | E.N.E. | „ | 1·5 „ |

## POINT BARROW.

The current after 6 a.m. carried us further from the land-water, and amongst the brash ice were some heavy floe pieces; we therefore unshipped our rudder.

At 10.40 a.m. I could see over Point Barrow into Elson Bay from the crow's nest, and made out the boat harbour on this side distinctly.[12]

[12] POINT BARROW.—This is the turning-point and gate of the passage eastward. Owing to the turn of the land here to the east, the current coming from Behring Strait runs pretty strong round the point, and being also a warm current, it keeps a narrow channel of water, more or less open, between the main pack and the shore; but at the same time it brings along with it floes of ice, detached during the summer from the pack, and which are often grounded in the shallow water about Point Barrow. A sailing vessel is, therefore, generally in danger in rounding this point of being carried by the current against one of these grounded floes, sometimes 40 feet thick; or, on the other hand, in trying to avoid that Scylla, she may fall into the Charybdis of touching ground on the varying shoals; and a vessel brought to a stop in such circumstances becomes an obstacle against which the mighty floes rush in their course and rear up over each other mast high. Captain Collinson speaks of their escape from it in a private letter, as "leaving a thankful remembrance on my mind, which yet vividly pourtrays the scene, enhanced as it was by the shouting and waving of two hundred Esquimaux, who had put off from the point in the hope, perhaps, of benefiting by our disaster."

The *Investigator* found the same difficulty in 1850; and, as Kellett pointed out, the passage is sometimes entirely blocked with these floes during the whole of the open season.

Directly after passing the point there is a greater breadth of channel and more space to work the vessel; and this freer passage continues to the Mackenzie River, where the effect of that flow of warmer water creates another change.

It is a happy tribute to the labours of the two Barrows, father and son, who assisted so greatly in Arctic exploration, that the two ice gates into the American Arctic seas, on the east and west sides, are both called by their name.—[ED.]

Our appearance created great sensation among the huts, and we could see a great number of people running about, besides numbers embarking in the *oomiaks.* As we came up with the Point we got sight of some hummocky ice, 50 or 60 feet high, which soon showed by the rapid manner in which we closed it that it was aground. Our situation was very critical, for the current evidently increased in rapidity, and if the ship touched either the ground or the ice aground, the most serious consequences might be expected. Most providentially, a fresh easterly wind sprung up, to which we made all sail, laying them aback, but the ice was so closely packed, that it had no effect at present; the pack, however, appeared rather more loose nearer to the shoal, when our canvas might be of service. In a short time, by watching the large floe pieces that were ahead of us, I saw that none ever came in contact with the ice aground, but after advancing within two cables' lengths, were carried along parallel to the barrier. Our only fear then was, that there might not be sufficient depth of water for us at that distance from it. Before our time came, we could see a narrow lane of water between us and the barrier.

Having made our approach within two cables, and finding 20 fathoms depth of water, my mind felt relieved, and I could now in some measure enjoy the scene on the barrier, on which nearly a hundred natives had assembled, shouting, waving, and trying to keep up with the ship, which the rapid rate we were driving at, and the rugged nature of the ice they were on, would not permit. Some in vain sought a place where they could cross on to the packed ice we were in, but the lane of water, although narrow between it and them, ran like a mill stream; others, embarking in their *oomiaks,* paddled down in the clear water between the barrier and Point Barrow, which was about one and a half mile wide, and thus getting ahead of the ship, perched themselves on the pinnacles so as to get a good view; and most likely with the same feeling that used to animate the Cornish wreckers in olden times. We were, however, not destined to be a prize to them this time, but drifted on to the E.N.E., parallel to the shoal,

and never more than a quarter of a mile from it, but not having less than 12 fathoms of water; so that it must be very steep to. At 6 p.m. the barrier took a trend more to the east, and the ice slackening a little, we increased our distance from it by a cable's length, but were soon again close beset.

The following is the set of the current throughout this day, but at times we were travelling faster over the ground, sometimes approaching, but never I think exceeding, three knots:—

| | | | |
|---|---|---|---|
| 10 a.m. . . | N. | (true) | 1·3 per hour. |
| Noon, 32 fms. of water, | N.E. by E. | „ | 1·8 „ |
| 2 p.m., 24 „ „ | E.N.E. | „ | 1·3 „ |
| 8 p.m., 14½ „ „ | N.E. by E. | „ | 2·1 „ |
| 10 p.m. 13 „ „ | N.N.E. | „ | 1·3 „ |
| Midnight . . | E.N.E. | „ | 1·5 „ |

*July 26th.*—At 1.30 a.m. we closed the barrier nearer than we had done yet, and I believe would have lost our bowsprit had not the ship answered to the canvas which was set; as it was, we passed very close, and had 11 fathoms of water. Immediately we had rounded this point we got among loose pieces, and so managed to get away from that which was aground. The depth of water, however, proved very irregular, and gave me some anxiety, as the shoal laid down by the *Nancy Dawson* was in our route; we, however, never got less than 10 fathoms, and at 8 a.m. shipped our rudder. At noon we could see the land to the southward, but were making slow progress, the ice being again very close. During the afternoon we were frequently beset, and found the current on these occasions (much to our mortification) setting to the westward.

During the 27th of July the ice opened at times, permitting us to make a little progress, but I don't think, notwithstanding all our studding sails and all our heaving with the windlass, we got ahead above a mile, nor could we perceive any current.

Throughout the whole of the 28th we remained immovable except for an hour about noon, when we managed to warp

her through one or two holes. The depth of water varied from 13 to 11 fathoms, muddy bottom. On the ice, which was much broken up, were many shells (*Nymphacea*), which at first we supposed might have been brought there by the birds; but coming alongside a floe on which were three large stones from 30 to 50 lbs. weight (greenstone), we could arrive at no other conclusion than that the mass we were alongside of, surrounded by ice as far as the eye could reach from the mast-head, had been in contact with the shore this season. The nearest land was ten miles distant, thus we had a curious proof of the extraordinary manner in which the floes are turned about and intermingled, and this at once gave a clue to all the dirty ice we had come in contact with last season.[13]

[13] Dust and Stones in Ice.—The phenomenon of the layers of dust in the body of the thick ice, which puzzled the captain of the *Enterprise*,—"The quantity of dirty ice excites the surprise of those who are accustomed to Polar navigation. Nearly a third of what we have seen is coloured with a fine impalpable powder"—(letter to Sir F. Beaufort, Aug. 31st, 1850), received some explanation from Nares' Expedition, 1875; during which they observed that at times when a continuance of dry weather had cleared the ground partially of snow, a strong wind would blow the fine particles of sand out on to the ice, and that during the summer this dust, heated by the sun, would eat into the ice. The circular holes mentioned by some voyagers are probably due to this action. Occurring in the body of thick ice seems to indicate a duration of several summers and winters.

The larger stones found in ice at a distance from the land, appear to be due to the action of the floes, when driven by wind and tide on to a sloping beach; they drive up the shingle before them until it topples over on to the surface of the floe, and is then carried off on it when a change of wind or tide occurs. These boulders would sink into the ice during the summer, and fall through if it melted sufficiently. Dr. Rae ('Proceedings,' Physical Society), mentions another way in which boulders of all sizes get into ice floes. The shore ice, especially when forming, rises and falls with the tide, and at low water frequently rests on the beach. Any boulders it rests on gradually become frozen to the underside of the ice, and are lifted with it at high water; and as the ice thickens they become imbedded in it, and may be carried out to sea. Then in the summer, the upper part of the ice melting, exposes the boulders in the body of it. (*Arctic Manual.*)

There is another discolouration of both ice and sea which was investigated by Dr. Brown, and which he found due to minute plants (*Diatomaceæ*); these were of black, brown, and green colours, according to the

different species, and extending for many miles, several miles wide, in Baffin Bay. Feeding on these are minute *Crustaceæ* and *Medusæ*, on which again the whales feed. These *Diatomaceæ* adhere to the underside of the ice, and by their heat form small holes in it, and are found in quantities in the ice, when it is thrown up in hummocks. (*Arctic Manual.*)—[Ed.]

*July 29th.*—We remained alongside the stones all the 29th, and could not get away from them, notwithstanding all our efforts. In the afternoon the current, which had hitherto been imperceptible, took a south-easterly bias.

We had a thick fog early on the 30th, but when it cleared away we had the satisfaction to find the land somewhat closer, Point Barrow from the crow's nest bearing S.W. by S. by compass; and what was of more importance to us, open water to the south not more than three or four miles distant. We, however, scarcely made any way till the afternoon, when by warping and boring we got into such loose stuff, that at 9.30 I shipped the rudder. It was, however, past 2 a.m. on the 31st that we got into the land-water, the edge of the pack being in 7½ fathoms. The temperature of the sea immediately rose from 32° to 37°, and eventually reached 46° during the day. As we stood into the land, which was from three to four miles distant, the water shoaled very gradually, and at 3.40 we tacked off the easternmost islet visited by Captain Moore last year, being in 3½ fathoms, and less than a mile from the shore.

Continuing to work to the eastward between the ice and the shore, which consisted of low sandbanks, with a large expanse of water between them and the main, we reached Point Tangent at noon. From the crow's nest many deer were seen, and I could plainly make out the cliff on the east bank of Dease Inlet. The mainland was very little elevated above the sea, its unevenness only being distinguishable by the numerous tarns. To the east of Point Tangent we found a pole stuck up, which I sent Lieutenant Phayre to examine. Nothing, however, of a European character was found about it, and it is most likely an Esquimaux guide post when the snow falls.

*August 1st.*—Making short boards off to the pack, which at times was not more than three, while at others it was eight and nine miles from the land, in which case the water gradually increased to 9 fathoms; in the afternoon two *baidars* came off, from whom we purchased some geese and reindeers' flesh, tobacco as usual being the main object with them. Neither Mr. Adams or Cousins could understand them, showing how much the dialects differ along the coast.

*August 2nd.*—In the morning watch of the 2nd two more *oomiaks* came alongside, having a number of geese, a few ducks, and some venison, which were regularly exchanged for tobacco, and after a little difficulty we persuaded them to come on board. Dr. Anderson, finding one of the women had a box inside her deerskin coat, induced her to produce it, on which, much to his astonishment, he found a wooden cradle hollowed out, in which was deposited one of the dolls so prettily dressed and fitted up for the expedition by Mrs. Washington; there was no mistaking it, even had its name "Harriette" not remained still pinned on it. I had unfortunately not taken notice of the young ladies' names, when I gave them away, otherwise I should have been able to identify exactly where it had come from. I had, however, only parted with them at Point Hope and Port Clarence, and taking the nearest of the two, this article of European manufacture must have travelled rather more than 400 miles since September last, a proof of the migratory habits of these people. Besides one or two useful presents, I added "Clemence" to "Harriette."

Having the wind from the N.N.W. we were able to lay along the land, but were soon driven closer in shore by the packed condition of the ice; the day being dull and misty, no observations could be got, which was the more provoking as by our reckoning we were sailing over Cape Halkett. In crossing Harrison Bay the weather still remained thick, so that we never saw anything of the Pelly Mountains. As we approached the Colville the colour of the water changed and it became evidently brackish. Owing to the hazy state of the atmosphere we could not see into the mouth of the river, which

I much regretted; on one occasion, however, we tacked in 9 fathoms on our inshore leg. The main body of the ice was as far as ten or twelve miles from the land; many large floes were, however, strewed about this space, and the ice became cleaner and more compact. At noon by our latitude, which was a pretty good observation, we were two miles inland; the coast line, therefore, of this point and Cape Halkett I have placed five miles further south than Simpson.[14]

[14] The position of Cape Halkett and adjoining coast, in latitude, has been corrected accordingly in the later Admiralty charts.—[Ed.]

At 10.30 p.m. we passed over a ridge with 6 fathoms on it, the water inshore deepening to 7½. The wind continuing from the eastward, we passed the whole of the 4th August in working to windward, between the ice and the shore. The land-water was now become strewed with large floe pieces, which caused us to lose much ground. Off Return Reef several of them were aground, and a current driving past them to the westward; in the short tacks we were compelled to make (the main body of the ice being closer here than we had yet seen it), we had the misfortune to fall foul of one piece, and by the shock carry away our anchor stock. The haze, which had been very inconvenient yesterday, thickened this morning into a fog, and after beating about some time without making anything to windward in consequence of having to bear up so frequently to avoid the floes, I made fast to a large one at 11 a.m. and took in some water, getting our anchors well up and as much out of the reach of the ice as circumstances would admit. With the horizon on the floe we got a very good latitude, nothwithstanding the fog, which however cleared off at 1 p.m., and the Romanzoff Chain opened to our view. With the exception of the highest peak no snow was to be seen upon them; and thankful at last we had picked up some landmarks whereby to fix the ship, and enable us to lay down the coast line with a little more accuracy than an eye-sketch, the necessary angles for determining the position of the most remarkable peaks were obtained. True south of us, distant about two miles, was a

low shingle bank, beyond which we could see Point Anxiety; and to the westward, lying from two to four miles from the main, the low chain of islets, along which we had been working in the haze, could be traced as far as Chandos Point. Making sail and working along shore, we found the sandbanks continuous to the Lion Reef; on some of them were ice hummocks and mounds 10 to 20 feet above high-water mark; and now we began to see driftwood on the beach in great abundance. Inside the banks the water was entirely free from ice, with the exception of a few grounded pieces; off the N.E. point of almost all of them the ice remained yet aground. We reached the Lion Reef half an hour before midnight, and were then overtaken by a rain squall from the S.E., which gave us a welcome lift of twelve miles to the eastward before it left us, which it did shortly after 2 a.m., August 6th. At 7, it being calm, and our boats unable to gain ground against the current, we came to with the kedge, and found it to be running W. by N. (true) 0·5 per hour. At 9.30 a breeze from the N.E. brought some heavy floes down upon us, and we had a difficulty in getting our anchor, and then made slow progress against both wind and current. The water shoaling more rapidly than usual, in one of our inshore tacks we took the ground in stays, and while we were endeavouring to heave off with a kedge, a squall similar to the one last night came to our aid, and we got afloat at 8.45 p.m. This breeze was more violent and accompanied by lightning, causing an increase of 20° in the temperature of the air. It continued fresh until midnight, we running before it, and avoiding the loose pieces of ice with some difficulty owing to the rain, through which however we got a glimpse of Flaxman Island, which appeared about 20 feet high. Towards the forenoon of the 7th, the wind drawing by west to north, the atmosphere became very clear, giving us a fine view of the whole range. To the east of Flaxman Island there are four sandbanks, and then a broad opening, opposite to which is the entrance of a large lagune. Barter Island, which we came up with at 8 a.m., and ran along within a mile of the shore, in 4 fathoms,

had much driftwood on it and several huts. At times we thought we heard the natives, but we never saw any. The main body of the ice was pretty close to Point Manning, but having a leading wind, we did not experience the same difficulty in getting past it as we did at Point Anxiety. Under the cliffs, which are from 30 to 40 feet above the sea, and the highest land we had seen yet at the sea-side since we left Point Barrow, was a sleigh.[15]

See Note 15, Appendix: Low Land, American Coast.

The wind chopping to the N.E., brought with it so thick a fog, that we were obliged to make fast to a floe at 4, and here we remained until 10 p.m., when it cleared sufficiently to see our road among the numerous floes. The current during the time we were fast ran N.N.E. (true) 0·5 per hour. A fog again compelled us to secure the ship at 3 a.m., August 8th, but clearing away again at 9, we made another start; the wind being light obliged us to keep a boat ahead, to prevent her falling off. At 5.30 p.m. there being little or no wind, recourse was had to warping, which we continued but with small result until 1 a.m., when a W.S.W. air enabled us to make sail, but we had great difficulty in steering the ship. Two black whales were seen, and the ice appeared now to be leaving the coast, so much so that at noon we were in 17 fathoms of water, and shortly afterwards passed through a stream of driftwood trending N.N.W. and S.S.E. The current at the surface ran E. by S. (true), 0·5 per hour, and at 10 fathoms N.N.E. ¼ E., 0·2 per hour; the temperature of the sea rising to 49° left us little doubt but that we had now reached the influence of the Mackenzie.[16]

See Note 16, Appendix: River Mackenzie.

Our westerly wind as usual came to us in the middle watch, to which we spread all sail, finding ourselves almost in an open sea, scarcely any ice to be seen. At 7, August 10th, however, we came up with heavy floes, pretty closely packed, and I began to fear we had done wrong in forsaking the land, and that we had thus lost a fair wind; but after making one

tack, trusting to a water sky, we pushed in among them, and were soon rewarded by getting in sight of blue water the other side, and at 1 p.m. emerged again into the open sea, having no ice whatsoever in sight to the eastward. Inshore (the land was now 28 miles off), we had a few straggling pieces, and the depth of water was 28 fathoms. Falling calm at 9 p.m. the current was tried, and found to set W.S.W. (true) 0·7 per hour. Before midnight a light north-easterly air sprang up, but we were obliged to keep a boat ahead constantly to prevent the undertow sweeping her head to leeward. The breeze freshened during the forenoon, and we hailed a short jumping sea as indicative of a wide expanse of water to the eastward; we made long boards reaching off to the pack, and occasionally entering the bights in hopes of discovering land to the northward. On the 12th August, the wind again falling, we again experienced a great deal of difficulty in steering; notwithstanding the boats ahead and all our trimming of sails, she turned round and round with us several times. The wind still falling light in the afternoon, we shifted our suit of sails so as to be ready for the autumn breezes. We made little or nothing on the 13th, and the weather being thick got no observations. In hopes of getting more out of the current, I stood on towards the land in the afternoon, and tacked in 15 fathoms probably about 12 miles from it, and at 10.15 p.m. tacked inshore off some large floe pieces. Getting an observation on the 14th, we found our true position 19 miles to the southward and westward, part of which (although a large allowance had been made in consequence of the difficulty of steering) may be owing to error. The weather cleared up and we could see Herschel Island to the southward, with a quantity of ice to the westward of it; the British, Buckland, and Richardson Mountains were also in sight; and from the crow's nest the ice could be traced from N.E. round by north to W.S.W. The 15th proved thick with drizzling rain, and we got no observation; and at 5 p.m. we tacked to the southward off the ice. During the 16th we had again great trouble to keep the ship's head to windward, and getting

some poor observations, had the mortification to find that we had been driven to westward of our position on the 11th. We found the water deepen very suddenly, getting no bottom with 140 fathoms on our offshore tacks among heavy floes; and standing inshore 10 miles, had 35 fathoms. On the 17th August, the wind came from the shore, enabling us to make way to the eastward, but bringing with it a thick fog; we got embayed in a floe, and were for a short time in a very awkward predicament, *i.e.*, alongside of it with a nasty swell running. Mr. Atkinson, however, cleverly managed to jump on the ice, and fixing an anchor for us, we soon gave her stern way by bringing the whale line to the bowsprit end, and she tailed clear without doing herself any harm. The fog clearing off we got sight of the land, but losing our breeze had again the same difficulty in steering. At noon we had 130 fathoms mud, and in the afternoon picked up a drift tree 68 feet in length, apparently not long in the water. On the weather-side of most of the floes driftwood was washed, and during the day we passed through several streams of it. At 4 a.m. on the 18th the edge of the ice trended N.N.E. and S.S.W.; we got but indifferent observations and sounded in 145 fathoms. A south-westerly wind however came to our aid, and enabling the ship to move through the water above three knots, we were at length able to steer her. On its dying away again on the 19th August I tried Lang's rudder, in hopes that would keep her head in the right direction, but although the boats were ahead she would have her own way.

We found the current as follows:

| | | | |
|---|---|---|---|
| 2.30 a.m., | E. by N. (true) | 1·0 | per hour. |
| Noon, | N. by E. „ | 0·5 | „ |
| 5 p.m., | S. W. „ | 0·7 | „ |

A westerly air sprung up at 9 p.m., which increased towards the morning, and we found ourselves at 6.30 in 11 fathoms. At 9 we got sight of the Pelly Islands bearing S. 25 E. true, and at noon saw another island to the E.N.E. of them. In the afternoon a second was seen. Our observations place them in:

Latitude 69° 37′ N., and Longitude 134° 32′ W.
and „ 69° 39′ N., „ „ 134° 10′ W.

They were but little elevated above the sea, and between them there was some heavy ice apparently aground.

| | | | |
|---|---|---|---|
| At 6.30 p.m. the current set | | W. by S. ½ S. | 0·6 per hour. |
| „ 11 „ | „ | W. by S. | 0·4 „ |
| „ 2 a.m., 21st „ | „ | W. by N. | 0·3 „ |

In the afternoon, August 21st, we came up with and passed through some loose streams. The wind failing again on the 22nd, we had the same trouble in steering the ship; but on this occasion no current was perceptible either on the surface or at a depth of 6 fathoms. At noon we were in 69° 49′ N. and 132° 58′ W. A remarkable knob on the land (which when the mist would admit we had never lost sight of since making the Pelly Islands) bore S. 16 E. true; and we were in 7 fathoms water, which shoaled to 4 at 1 p.m., when we tacked to the north, and reached the pack edge after a N. by E. (true) course of 12 miles. On our inshore tack, after 10 miles run, we again got into shoal water, having 3½ fathoms coarse sand and black specks. On standing in again, we passed over the bank, getting not less than 4¾ fathoms, the depth inshore being 6½ fathoms. The limit of the bank easterly will therefore be 132° 30′, and it lies 30 miles to the north of Toker Point. In the afternoon we had smoother water, getting probably somewhat under the lee of Cape Dalhousie, and stood into 6 fathoms, being then 16 miles from the land. Making a long leg to the north of 38 miles, after passing among loose floes we tacked, at 11.40, off what looked very like the pack edge; and then going into the shore fetched the sandy point off Cape Brown, getting 5 fathoms 2 miles from the beach. A remarkable knob on the land bore S. 3° 13′ E.; the bottom, generally speaking, was mud, but every now and then we had a cast with sand and broken shells. On reaching off 34 miles, we could distinctly trace the ice, from E.N.E. (true) by N. to S.W. On the 25th August, we passed among loose

pieces, but much wasted, some of it, however, being still very compact.

### CAPE BATHURST—TURN NORTH.

On the 26th a southerly wind enabled us to steer a course, and was too precious to be wasted in looking into Cape Bathurst; so making all sail, we were soon not only going 7 knots, but had actually run out of sight of every particle of ice. At 1 P.M. the Booth Islands and Cape Parry were seen, on which we shaped a course for Wollaston Land. During the first watch we had every appearance of land to the north of us; and before midnight had the satisfaction to find it was not Cape Flyaway, and hauled to the northward to close it, getting no bottom with 100 fathoms of line.

*August 26th.*—As we approached the shore we could plainly make out three separate ridges or islands, terminating to the westward in a bold perpendicular head, to which the name of Cape Erebus (now Nelson Head) was given. At noon we were in 70° 54′ N. and 120° 59′ W., and at 5 p.m. got soundings in 78 fathoms, red clay. The wind remaining light and baffling, until the morning, when it settled to the northward, we worked to windward, and tacked at 4.40 a.m. in 9 fathoms, about 4 miles from the shore, along which were ice cliffs; standing in again at 8.45, we tacked in 7 fathoms, 2 miles from the beach, which the hills approached by a gradual slope. A few straggling pieces of ice were off the land, but otherwise the sea was perfectly open. At noon, August 27th, we were in latitude 71° 27′, and longitude 120° 3′; shortly after which land was discovered to the eastward. After making a short tack, we stood towards it, and at 7 were less than a mile from the southern end of a low island (on which a bear was walking), and had 5½ fathoms. Inside of the island was a deep bay, the bottom of which could not be seen. Then crossing over to the western shore, we ascertained that the gulf or strait was 25 miles wide, and had 90 fathoms in mid-channel; therefore worth exploring. In the morning, August 28th, we had not made much progress, and from the crow's nest I

BEAUFORT SEA
MAP OF
CENTRAL ARCTIC AMERICA
showing the tracks of
H.M.S. ENTERPRISE AND INVESTIGATOR in 1850-54.
BANKS LAND
BARING LAND
MELVILLE SOUND
PRINCE ALBERT LAND
McCLINTOCK CHANNEL
BARROW STRAIT
PRINCE OF WALES LAND
NORTH SOMERSET
BOOTHIA
VICTORIA LAND
WOLLASTON LAND
ESQUIMAUX
ESQUIMAUX LAKE

could see over the low land into the bay, behind Bear Island.* At 11, the wind having left us, and being well in with the eastern shore, I determined on landing in order to obtain a view from the hills. On the beach we found several pieces of driftwood, and walking into the interior, found the soil composed of clay, with numerous loose stones; here and there stunted grass and willows. Passing several tarns, and seeing several flocks of geese, we gradually got to the summit of the coast hills; and finding our view to the north-east still obstructed, followed the ridge along. On arriving at the crest I had the satisfaction to see a clear open strait, as far as the eye could reach, in a north-easterly direction: and while taking the necessary bearings heard our Newfoundland dog Neptune give tongue, and soon saw him in chase of three deer, which he fortunately turned between Mr. Adams and my coxswain and ourselves, and passing within shot of the former, one was immediately knocked over. Having skinned our prize, and each one taking a load, we set out for the beach. In the meantime a southerly wind had sprung up, and the ship had drifted a long distance up the strait, above where the boat had landed; being uncommonly anxious not to lose any portion of our fair breeze, I pushed on ahead and soon got down to the beach; but I had a long and tiresome walk to the boat, being from want of exercise quite exhausted when I got there; in my route I came across recent chips, a kind of coarse seine, and several circles of stones, showing evidently the land we were on was inhabited. The ship, seeing the rest of the party down on the beach, sent a boat to bring them off, and we all got on board a little before 7, and made all sail to the N.E. Our deer weighed 100 lbs.

At 2 a.m., August 29th, having run by our reckoning 36 miles, an island in the centre of the strait was reported, and on going aloft I could make out a beacon on it; the hour and a half which elapsed before I got on shore to examine it were anxious moments to us all. On landing all hopes of its belonging to the missing expedition were immediately dissipated, for on the beach was a pile of preserved

* Now Ramsay Island.

meat tins, surrounded by a cask of provisions, and beside them a whale boat bottom up. After rummaging everything, without obtaining a clue as to whether it was our consort or the *Resolute** that had made this deposit, recourse was had to the flagstaff on the summit of the island, nailed to which were two copper cylinders, one of which contained a Union Jack, and the other a notice from Captain M'Clure, by which I learnt that the *Investigator* had wintered in safety in the pack, 4 miles N.E. of these islands; that a party from her had reached the north end of the strait in the month of October, and that the strait was called Prince of Wales, the islands Princess Royal, the south shore Prince Albert's Land, and the north Barings; on the former, 70 miles to the southward, Esquimaux had been met with. It was dated June 1st, but which direction he had gone in I was left to conjecture. However, I at once made up my mind to go to the north end of the strait, and look for a place to winter in, from whence we could send our exploring parties; and it wanted but sixteen days of the date she had been frozen in here last year; so getting on board again, we made all sail to the N.E., and found the straits now not more than 4 or 5 leagues across, with a depth of 50 and 60 fathoms in mid-channel. At 2 p.m. we began to see ice on each shore; the wind, however, came round to the N.W., and compelled us to work to windward. While so occupied another beacon was seen on Prince Albert's Land, which I sent Mr. Phayre to examine; the boat had some difficulty in getting into the shore, on account of the ice, and it was nearly dark when he reached the post, so that he could scarcely see to read the information, which was dated on board the *Investigator* in April, and was deposited by one of the spring travelling parties. The boat got back at midnight, and the pack not being far from us, I worked up to its edge, and when there we could see well round both points; but I found our further progress in this direction blocked by immense fields of ice, leaving no land-water. A bold high bluff (probably the same seen by Sir E. Parry from Melville Island) was seen

* See Note 18, p. 162.

on Banks or Baring Land to the north; but I could not see Melville Island.

### Furthest North.

Our furthest point reached in that direction, August 31st, was lat. 73° 30′, and long. 114° 35′ W., and to the eastward in lat. 73° 25′ we reached 114° 14′ W. long. Bearing up at 3 a.m., with the determination of putting the ship into a small bight we had noticed on Baring Land; when, however, we reached it, we found it choked with ice since the previous afternoon; the ice was streaming very fast on both sides of the strait, and we now found it much further inside than it was yesterday. During the forenoon we passed a bottle, but got nothing for our pains in picking it up. I then hauled across the strait to examine what promised to be a protected bay, but on sounding it was found too shallow. As we were now within 40 miles of the *Investigator's* winter quarters, and therefore could not expect to do more than re-examine the same ground she had done, I came to the conclusion of running for Cape Erebus, and looking for a harbour on the western side of Baring Land; all sail was made accordingly, and at 3 a.m., September 1st, a boat was sent to the Princess Royal Islands to deposit information and obtain a little water, some of that we had got from the floes having turned out brackish. The current, which had aided us in our progress northerly through the straits, at an average of 2 knots per hour, now assisted our return, and is therefore caused by the wind. At 8.45 p.m. we rounded the S.E. point of Baring Land, off which were still the same floe pieces we had seen before; and on one of them was a bear, which (our dogs being much in want of food, besides the chance of affording a fresh meal to ourselves) I could not resist the temptation of striving to get. Mr. Phayre, in the whaler, succeeded in shooting him in the water without difficulty. We then hauled to the westward for Cape Erebus (Nelson Head). Our days had now begun to show symptoms of closing, and not wishing to pass what appeared to me to promise a good harbour, I hove to during part of the middle

watch; and when daylight broke sufficiently we kept along shore, and now found the land continuous, and not broken into islands, as I had imagined when we first made it. At 6, September 3rd, I left to examine what appeared to be an inlet immediately to the east of Cape Erebus. On landing it proved to be a large lagoon, with two shallow outlets; about the shores of it were a great many musk ox heads, apparently very old; but the tips of some of the horns having been cut off with a sharp instrument, showed that man had been here. We also found an old paddle, much weather-worn, considerably above high-water mark, besides which the heaps of stones in the vicinity of the skulls were evidently *caches;* but no recent traces of natives were seen. Several flowers were out in great beauty, giving me a more favourable opinion of the climate and soil than I had hitherto.

Having established the fact that there was no shelter here for the ship, I returned on board at 10.45, and we made sail round the cape, which is a very remarkable headland, being of a totally different character from the adjacent country. The cliffs rise very abruptly from the sea to the height of 800 feet, being streaked red horizontally, which I found in the course of my morning's walk proceeded from the presence of iron ore. At the distance of 2½ miles from shore we had 117 fathoms water. Our observations place it in 71° 03′ N., and 122° 50′ W. The land, on rounding it, was found to trend to the north. The wind continuing to blow from the northward and westward, we had to work to windward, and found the coast very steep to. The cliffs soon began to lose their elevation north of the cape, and at length entirely disappeared, giving place to round hills, on which there was a good deal of grass. Light and baffling winds kept us in sight of it during September 4th; but on the morning of the 5th the wind coming from the eastward enabled us to steer a course along shore. I sent Mr. Phayre in the whaler in shore of us to examine any bights that might afford shelter to the ship, and also to prevent our missing any marks which might be erected. Keeping in 11 fathoms about 2 miles from the shore, we soon saw two bears on the beach

ahead of the boat. Lieutenant Jago being on the hills walking, Mr. Phayre landed one man to warn him, and then ran along under sail towards them. The cub took inland, and the mother, after receiving the discharge from the boat, took to the water. The former being turned by Mr. Jago and Neptune, came down to the beach, where the dog kept him at bay in the most capital style, sometimes jumping over him, until at length he also took to the water, on which the dog immediately followed, and we sent a boat from the ship, which soon despatched him; while a third boat pursued and killed the mother, she having then got nearly two miles from the land. The chase altogether was very exciting, as from the ship we had a perfect view of the operations of all parties. A second cub was afterwards seen on the beach, but having expended an hour in the chase, I could not afford to lose any more of our fair wind. Shortly after noon we came in sight of a large expanse of water inland, which promised to afford the desired harbour. I sent a second boat to examine, but both returned at 4.30, having found a shallow bar across the entrance. We then altered our course to the westward, to pass outside of a long low projecting spit, opposite to which we were at 11.30 p.m., when I hove to for daylight.

*September 6th.*—When it broke, we found ourselves opposite to a deep bight, the southern extreme of which was formed by a long low narrow tongue, but little elevated above the sea, and curved at the end.* Entering the bay and finding it shallow, with several sand-banks, two boats were despatched to examine it. One going to the eastward, found the channels between the sands all too shallow to admit the ship; the other, finding a cask with a notice from the *Investigator* on the spit, returned immediately. It was dated on board of her August 18th, and by it we learnt that she had left the Prince of Wales Straits on the 16th, so that she must have doubled Cape Erebus only ten days before we sighted it, and had the wind at that time been from the eastward, instead of the west,

* Cape Kellett.

I should probably have explored the west face of Baring Land, instead of entering the Prince of Wales Straits; and then most likely we should have fallen in with her. The point appearing sufficiently curved to afford us shelter for the winter, I then determined to employ what remained of the season in pushing north, and depositing provisions for our exploring parties. On running out of the bay, we had the misfortune to get on shore on a sand ridge three miles from the north point of the bay, and which had apparently deep water inside of it. This occurred at noon, but it was 7 p.m. before we extricated ourselves from a very unpleasant position; providentially the water was very smooth, but had there been any swell she must have bumped very hard, as the bottom was sand. On making sail, we found the coast now shoal to, not getting more than 5 fathoms, and being six miles from the land. Hauling to the westward, we soon found ourselves among floes of heavy ice, apparently but recently broken up. On the 7th of September at 4 a.m., the packed ice extended from N. by W. to W.S.W. At nine we were off a small islet, and found the main body of the ice close to it, and the open water so strewed with floes, as to render it very doubtful whether we could turn to windward among them. I therefore determined on returning to the south, believing that a westerly wind would cut off our retreat to the only harbour we had seen, and leave us exposed on a shoal shore. I sent Mr. Phayre, therefore, to erect a mark, and deposit twenty days' provisions for eight men, with information of our proceedings and of my intentions. The islet, which I named after the *Terror*, is in lat. 72° 52′ N., and long. 125° 24′ W.; it is about 180 feet high, being one mile from the main, and has a sandy spit extending south-easterly from it. A point of land bore N. ½ E. true from it, but the intervening coast could not be traced. The ice mates were of opinion that the ice here had only just left the coast; and not finding any notice from Capt. M'Clure, I came to the conclusion that, finding the pack close in with the land, he had followed its edge to the southward and westward, with a view of tracing the influence of the Mackenzie on it, and

thus exploring the intervening sea between us and Point Barrow as far as it would admit. At 10 p.m. we got back into more open water, but finding ourselves in 5½ fathoms with an easterly swell, I hauled off shore into seven and eight. We got back into West Bay the next afternoon, and came to an anchor half a mile from the north-east end of the spit. I then sent a boat to sound inside. Mr. Skead on his return reported a sufficient depth of water, but that it was exposed; and recollecting the rapid way in which we had seen the bight at the north end of Prince of Wales Strait fill, I came to the same conclusion. We weighed at daylight, and stood up into the S.E. corner of the bay, the channel between the sandbanks in this portion of it not having yet been examined. The boat, however, returned with the report that there was only ten feet of water between them; I had, therefore, to relinquish the idea of wintering here; and now I fell back on the inlet we had seen at the entrance to the Prince of Wales Straits, which had promised, like it, to lead into the Archipelago of Victoria, Wollaston, and Prince Albert Lands. We therefore stood out, and had a narrow escape in passing the spit, off which the sand runs in ridges, evidently turned up by the heavy ice grounding, and rendering it impossible for a person to judge on which side he is likely to find deeper water. We had a cast under 3 fathoms, but under the favour of God she did not strike; getting an offing, I kept more to the west, sighting the ice on our off shore tacks, and thus tracing it as far as 71° 15′, when the pack edge was to the eastward of 127°.

The wind freshened considerably from the south-eastward on the 10th of September, bringing with it an uneasy sea, which led me to congratulate myself on being extricated from among the heavy floes, which the period of darkness now would have rendered difficult to avoid. During the 11th, the wind moderating, we made some progress to the southward, sighting Cape Erebus in the afternoon. Being close in shore during the forenoon of the 12th, I sent Mr. Phayre to get a turn of water, and leave information of where it was likely we would be found. The Cape bore S. 65 E. 22 miles

at noon, but it was 10 p.m. before we rounded it, and bore away for Bear Island, which we reached at noon on the 13th. A long ground swell rolling in, and getting very uneven soundings, compelled me to haul off, and on sending a boat we found the anchorage under it too open. Towards night the wind fell, and at 4 a.m. the whaler was sent to examine the inlet. We remained becalmed until noon, when we were enabled to follow; and at 4.30 Mr. Skead returned with the welcome intelligence of having found a well protected anchorage, in which we came to at 7.45 p.m.[17, 18]

[17] THE INVESTIGATOR, 1850–51.—After the *Investigator* parted from the *Herald* on July 31, 1850, she had the good fortune to get through the ice gate at Point Barrow on August 5th, being thus the first ship to navigate the channel along the North American coast; though not the first to pass Point Barrow, Mr. Shedden having succeeded in doing so in the *Nancy Dawson* yacht in 1849. It is a good evidence of the difficulty of navigating that channel even in a favourable season, that she took the same time to reach Cape Bathurst as did the *Enterprise* in August, 1851, namely, twenty-five days, the distance direct being 700 miles: a passage which a steam vessel would have done in less than a week. It is the absence of favourable winds and the resistance of the ice floes which waste the opportunities of sailing ships in Arctic seas. She tried to get N. before reaching Cape Bathurst, but was stopped by the solid pack, after working along a lane of water for one hundred miles from land.

She found an open sea, as did the *Enterprise* next year, opposite Cape Parry, probably due to the turn of the warm easterly current up towards the Prince of Wales Straits; and worked up those straits to near the northern entrance. But there the stream of the ice floes which come through the channel between Banks Land and Melville Island and down the straits, completely barred further advance, although it was the most favourable time of a favourable season. She wintered near Princess Royal Islands in the open channel, in the midst of the pack ice: a situation M'Clure had expressed his resolve to adopt, but which after his experience that winter, he avoided on the next occasion. Several other vessels have passed an Arctic winter in the midst of the open ice field, beyond the shelter of land, without serious injury; but the record of the *Investigator* shows that it is a situation of perpetual anxiety and ceaseless danger; more especially at the setting of the ice in September, and at its breaking up in July, but also during the winter from the movement of the ice by the tides and currents. And she did not get free till August 16th, 1851.

The Captain, however, had his reward. On October 26th, 1850, he reached, with a sledge party, the north-western point of the straits, and from a height of 600 feet looked over a stretch of ice, hilly enough, but

unbroken by land, upon that Melville Island, from which, thirty years before, Captain E. Parry had first seen the point M'Clure was then standing on. Though it was sixty miles distant, no Arctic sailor could doubt that the only obstacle to prevent the *Investigator* reaching it was the field of ice before him; and, therefore, that he veritably saw with his own eyes the last link in the N.W. Passage which had been sought in vain by British seamen for more than two hundred years. And as he himself had just successfully made some 1200 miles of that chain of discovery, it was a proud moment for that daring commander. But alas! for human ambition; he had no sooner grasped the object of his desires in coming to the Arctic seas than he discovered its absolute uselessness.

No seaman could look on that field of ice hummocks, and knowing that it covered a far greater thickness below water, without feeling that no ship could expect to cross it but at some exceptional season of rare occurrence. This was the verdict of Parry when he discovered it in 1821, and of M'Clintock when he saw it in 1851 and 1853, and of Collinson in 1851, and the *Investigator* herself still remains on that side of it, a perpetual evidence that although it is a N.W. Passage it is not one which could ever be available for any ordinary navigation.

So in 1851 she turned back down the Prince of Wales Straits again, and then, full of the prevalent idea at that time of getting to the N.W., M'Clure worked his way round the west side of Banks Island, along the narrow channel of water between the massive pack and the shore; a channel which is found in summer along the coast of almost all Arctic lands, and which appears to be formed partly by the action of the tides, and partly by the currents; in this case undoubtedly by a branch of the warm current from Behring Straits coming along the main coast of America, as is evidenced by the drift timber along the shores of Banks Island, which could only come from that coast. As the *Investigator* came to the north of the island she met with the huge ice hummocks like little bergs, peculiar to the open Polar Ocean, and which are continually driving through the straits between Banks Island and Melville Island into Melville Sound beyond. After more than the ordinary escapes from being crushed between the exceptionally massive moving floes, she was finally ice-bound in an inlet on the N. coast on Sept. 23rd, 1851; to which, in acknowledgment of their providential escape, the Commander gave the name of the *Bay of Mercy*, and there her timbers remain, as far as we know, to this day.

During those fortunate two months of August and September, 1850 and 1851, the *Investigator* had done much to enlarge our geographical knowledge of the N.W. coast of America, besides discovering the Prince of Wales Straits and the insularity of Banks Land, and a N.W. Passage. The *Enterprise* has an equal merit in most of these discoveries, having made them in ignorance of the information obtained by her consort, and even of her intentions as to the course she proposed to pursue; but in such explorations the old rule of "First come, first served" is the only one by which a government can be guided in dispensing the regulated

rewards for such discoveries. What the *Enterprise* was entitled to and did not get, was an acknowledgment of the merit, under peculiar difficulties, of having made the same discoveries, and more extensive ones, and withal of bringing ship and crew back to England in good condition.—[ED.]

[18] THE EASTERN EXPEDITIONS, 1850–51.—In the spring of 1850, after the departure of the *Enterprise* and *Investigator*, several expeditions went by the eastern route to carry on the search. Four of Her Majesty's ships, the *Resolute*, Captain H. T. Austin, the *Assistance*, Captain E. Ommaney, the *Intrepid*, Lieutenant J. Osborn, the *Pioneer*, Lieutenant J. B. Cator, went up Baffin Bay into Barrow Straits, and got as far as Griffith Island; from which, in the spring of 1851, Captain Ommaney explored the west coast of Prince of Wales Land, and Lieut. M'Clintock the south coast of Melville Island. They discovered in the autumn of 1850 the *first trace yet found of the missing expedition of Sir John Franklin*; but which, to the great disappointment of the whole Arctic party in England, contained no clue whatever to their subsequent proceedings; all that was learnt was that the *Erebus* and *Terror* had wintered at Beechey Island (at the south entrance to Wellington Channel) in 1845–46. Whether they had gone north, south, east, or west from there in the summer of 1846 was as uncertain as it was before. And the exploring parties found no other trace of them in any other direction, not even at Cape Walker, where Franklin was expressly desired to touch, except indeed, that an exploring party from that ill-fated expedition had gone a little way up Wellington Channel. In the autumn of 1851, Captain Austin, concluding from all the information he had obtained that Franklin had gone northward, thought it better on the whole that he should return home, so that an expedition fully prepared to prosecute an extensive search northward should be despatched in 1852.

Attached to Captain Austin's expedition were two small vessels under the command of Mr. W. Penny, a famous Arctic whaling voyager; he explored Wellington Channel up to Baillie Hamilton Island, and found no traces; although we now know that Franklin's ships went up that channel in 1846 much farther north than that island. Mr. Penny's vessels returned with Captain Austin.

There were also two private expeditions up Baffin Bay in 1850, one consisting of the *Prince Albert* under Captain Forsyth, R.N., and the other of the *Felix* and *Mary* under Sir John Ross. The *Prince Albert* examined Prince Regent's inlet and returned in the autumn of 1850, but sailed again in 1851 under Mr. Kennedy, and wintered 1851–52 in the same inlet, and explored it as far as Bellot Straits, returning home in 1852. Sir John Ross wintered 1850–51 at Cornwallis Island, and returned in 1851. None of these vessels found any traces of Franklin's expedition.

And there was also the *United States Expedition* under Lieutenant de Haven, which went up Baffin Bay into Barrow Straits in 1850, and was caught in the ice in the autumn of that year, and had an astonishing experience of a winter in the open pack, having been carried up Wellington

ton Channel, and then down it, and out through Barrow Straits into Baffin Bay, and down that Bay as far as the Arctic circle before they were liberated from the ice in the summer of 1851.

And, lastly, there were the land and boat exploring parties. Commander Pullen (*Plover*) from Behring Straits to the Mackenzie River in 1849, and towards Cape Bathurst in 1850; in returning from Cape Bathurst westward in the latter year, Pullen passed the Mackenzie River a day after M'Clure in the *Investigator* had passed it going eastward. Such were the mischances of Arctic exploration. And Dr. Rae (Hudson's Bay Co.) began his long series of searches on that northern coast, ending in the discovery of the true traces. In 1851 he explored from Prince of Wales Straits to Victoria Straits and found the first of those traces, some pieces of wood in the latter straits afterwards confirmed to be part of the missing ships. But land or boat exploring parties are not prepared to winter on that coast; he therefore had to return south, and did not finally succeed in following up the clue he had got till 1854.

Thus it happened that in the winter of 1851–52 of the thirteen vessels which had been engaged in the search, only three remained, the *Enterprise* in Prince of Wales Straits, the *Investigator* on the north of Banks Island, and the *Prince Albert* in Prince Regent's Inlet; and none of them were aware of the presence of the others.—[Ed.]

## SECTION IX.

### PRINCE OF WALES STRAITS.

### WINTER 1851–2.

*September 15th.*—Having come to the conclusion that these would most likely be our winter quarters, the second whaler under Lieutenant Parkes was despatched to examine the north-east side of the inlet; the bottom of which we had not distinctly seen; and also to erect marks on the point opposite Bear Island (Ramsay Island), so as to direct any parties travelling along the coast to us.

At daylight I reached the summit of the hill over our anchorage, and found we were inside a projecting point in the centre of the bay, the bottom of which I could not see on either side; but about half a mile to the north-east was the narrow entrance to a very good harbour. The bays also east and south of us appeared more eligible positions than where we now were. Leaving word with the senior lieutenant to send out a shooting party, and to warn them that the ship would most probably move southward and eastward, unless I found the inlet near us deep enough to admit the ship, I set out to examine them. First looking at the harbour near us, I found only ten feet of water at the mouth, so it would not do. Then going to the southward, at the distance of two miles, I turned up the eastern arm, which proved to be three miles long and one and a quarter across, with a small cove on either side of it. After taking a look at it from the hills, and putting up four hares, I found it would suit our purpose well. There was 10 fathoms of water close to the beach, and not far off a small tarn; with a run of fresh water in the head of the bay. The only

objection was its being open to the westward; on examination of the beach, however, I did not detect either surf or ice-marks; and therefore returned on board at 10.30, and at 2 we were at anchor in the spot I intended the ship should occupy during the winter. Our shooting party not returning, some men were sent to look for them, and these coming on board without having seen anything of them, the third whaler was sent to our former anchorage, and brought them on board at 3 a.m.; they had shot two hares, which, picking up drift-wood enough, they had cooked for supper.

*September 16th.*—The ship was heeled over, in order to enable the carpenters to get at the copper, which for five streaks down was much jagged; a party were employed cutting turf and building an observatory.

On the 17th I commenced the survey of the bay, and went out towards the entrance, where, on the south side we had seen a remarkable hill; from it, which I found to be twelve miles from the ship, I had a good view of the surrounding country, and saw that there was a deep bay to the south-ward of us; I also got sight of the second whaler returning from Bear Island, along the north shore. On getting back to the ship, I found the shooting party had fallen in with a number of natives, who were much frightened, but one of them was prevailed to accompany them to the ship, and after being on board some time and receiving several presents, went away well satisfied. During the dark, we fired muskets every two hours, to point out our position to the whaler. On the 18th September the survey was continued, but I kept in the neighbourbood of the ship in hopes the natives would pay us a visit. On ascending the hills on the south side I found the inlet I had seen yesterday ran up quite as deep as the one we were in, and that to all appear-ance a narrow neck of land only separated the two bays. We got a flagstaff up on the hill over the ship, both as a mark for our own people, and a guide for any persons who might wish to come to us.

I left early this morning with Mr. Adams with the intention of looking after the natives; following up the

valley, at the head of the bay for five miles, we then climbed the hills to the southward, and took a long circuit without succeeding in our object; but had a very good look at the country, which appeared to abound in lakes, some of which were very deep; we also got sight of ten deer, who tantalised us by permitting an approach within musket shot, but got scatheless away. From the top of the hills, from whence I obtained a much better view to the southward than before, I could not see the end of the inlet to the southward. On my return I was glad to find that Mr. Parkes had come back; and Mr. Skead started to erect marks, and to explore to the southward as far as seven days would admit. Mr. Parkes had reached Bear Island, and traced the northern shore of the bay, thereby settling the fact that we were on Prince Albert's land, and erecting two good marks with information as to our position.

On the 20th September I walked across the isthmus to the southward, and soon came in view of what appeared to be too great an expanse of water for a lake; and on reaching its shores the tide-mark and driftwood proclaimed it to be the sea, although some of my party were not convinced, so completely land-locked was it, until they tasted it. We saw five more deer, and found we could accomplish the distance from sea to sea in little more than an hour, nor had we occasion to ascend any hill above 200 ft. high.

*September* 21*st*.—Sunday was spent quietly; some of our people walking out in the afternoon fell in with the native tents, which were not far from us, and must have been pitched since we were out looking for them on Friday.

On Monday I took a tent with me, and camped over in South Bay, so as to carry my triangulation out in that direction. On board, they had plenty of occupation in lightening the ship, so as to enable the carpenters to get at the iron plates about her bows, some of which were destroyed by the heavy blows she had got, in forcing her way through the ice. A party of natives came down on the 23rd, and appeared much afraid of the water, showing some reluctance in getting into the boat. I returned just as they were

leaving, but saw enough to confirm the report that they belonged to the Winter Island or central tribe, which we found by Captain Washington's vocabulary and their costume. They did not appear to be very well off as to food or clothing, and but few arrows were tipped with iron.

*September 24th.*—On Wednesday Mr. Jago left the ship to collect driftwood, which was more abundant on the beach in South Bay than about us. On board we were employed about our housing, and on shore turf-cutting and house-building; and commenced the issue of bread in lieu of biscuit.

Mr. Skead returned on the 26th September, having circumnavigated South Bay (Minto Inlet), which he found to be sixty miles deep and rather more than twenty miles across at the entrance. On the southern point of it, which for the sake of distinction I have named Point Wollaston, he found a notice deposited by one of the spring parties from the *Investigator*, dated on board of her at the Princess Royal Islands, April 21st. This party had also been to the head of the bay, as not far from it part of a pemmican tin was found. I was glad to get the boat back, as in the bay ice had begun to form, and I feared might stop their return. On Saturday the ship was swung for local attraction, and we found our compasses totally useless with the ship's head at south, and very sluggish in their movements. The variation with her head west was 44°·25 E. and with her head east 120°·31 E., that on shore being 78°·50 E. In the afternoon Mr. Jago returned, having stacked a good quantity of wood in South Bay.

Sunday found all our preparations for the winter well forward, and was spent as usual, those men who chose being allowed to walk in the afternoon.

On Monday morning I resumed the survey, while the first and third lieutenants went over to South Bay on a shooting expedition for three days. We cleared out a portion of our main hold, and landed the casks so as to leave ample room around Sylvester's stove, which was now lit for a short period every day. The 30th September was employed in the same manner, and I had now got nearly all the data I required

for the survey of the bay, with the exception of the soundings. The month closed without the bay having been frozen over, but the ice was already thick enough on the lakes to enable us to walk across them; the transparency of which and clearness of the water enabled us in most cases to see the bottom distinctly, as well as some fish.

*October.*—One of the men, George Deverill, marine, returning from Mr. Phayre's shooting party on the 2nd, with six hares, left again with another day's provision for them. The next morning Mr. Parkes came on board with the distressing information that he had not been seen.

Mr. Jago had set out early in the morning to relieve Mr. Phayre at the tent, which would increase the party over there to eleven men and two officers. I also camped Mr. Skead out in another direction, but we got no tidings of him that day.

At daylight on the 4th I left with another party, and after a long round, and attempt to trace his footmarks, reached the South Bay encampment at noon, without success. My only hope now was that he had reached the native encampment, which was in one of the bights in South Bay, and whither Mr. Skead had gone in search of him. The salt water ice in the head of the bay was sufficiently firm to permit us to cross it. While resting ourselves the ship fired three guns, thereby giving us the welcome intelligence that the man had been found. On my return I found that he had come on board from the northward and eastward, and could give no account of how it was he had missed his way; and as the day was clear, the only conclusion I could come to, although strenuously denied, was that he had stupefied himself by drinking some of the spirits he was taking across, a bottle of which was broken.

On the 7th of October, we made a trial with our balloons, and sent up a large and small one, which went away in a north-westerly direction very cleverly.[19]

[19] Balloons.—"The balloons as a more novel attempt for distant signalising, or rather, intercommunication, were a subject of deep interest. The plan was simple and ingenious, the merit of the idea as applicable to

the relief of Sir John Franklin, by communicating to him intelligence of the position of the searching parties, being due to Mr. Shepperd, C.E. It was as follows: a balloon of oiled silk, capable of raising about a pound weight when inflated, was filled with hydrogen evolved from a strong cask fitted with a valve, into which, when required for the purpose, a certain quantity of zinc filings and sulphuric acid was introduced. To the base of the balloon, when inflated, a piece of slow match five feet long was attached, its lower end being lighted. All along this match at certain intervals pieces of coloured paper and silk were secured with thread, and on them the information as to our position and intended lines of search were printed. The balloon when liberated sailed rapidly along, rising withal, and as the match burnt the papers were gradually detached, and falling, spread themselves on the snow, where their glaring colours would soon attract notice, should they happily fall near the poor fellows of the *Erebus* and *Terror*. The farthest distance from the point of departure at which any of these papers were found, as far as I know, appears to have been about fifty miles." (Osborn's *Arctic Journal*.)

Extract from letter from Mr. Shepperd to Capt. Collinson, March, 1850: "A balloon 5 ft. diameter carried 2500 printed slips, and distributed 1200 of them over the South of England by a slow match at every five or six miles; passing from London over Woolwich, Chatham, Maidstone, Dungeness, having travelled 120 miles at the rate of 35 miles an hour."

In the *Enterprise* several of these balloons were sent off during each winter; and went off "cleverly," but no results are recorded as to the finding of any of the printed papers. A sketch of one is in M'Dougall's voyage of *Resolute*.

*Carrier Pigeons.*—Though not employed in the *Enterprise*, the following notice about them in Arctic voyaging will be useful. "Next, as a means of communication, came carrier pigeons. When first proposed in 1850, many laughed at the idea of a bird doing any service in such a case, and might have laughed yet had not one despatched by Captain Sir John Ross, from his winter's quarters in 1850, actually reached its home, near Ayr in Scotland, in five days. It was done on the 5th of October, 1850, from Assistance Harbour; two birds duly freighted with intelligence and notes from the married men were put in a basket, and attached to a balloon in such a manner that, after consuming a certain quantity of match, the pigeons would be launched into the air to commence their flight; when we heard of this the opinion prevalent was that the birds would be frozen to death. We were mistaken; for in about 120 hours one of these birds, as verified by the lady to whom it belonged, reached her house and flew to the nest in which it had been hatched in the pigeon-house; it had, however, by some means or other, shaken itself clear of the packet entrusted to its charge. This marvellous flight of 3000 miles is the longest on record." (Osborn's *Arctic Journal*.)

Sir John Richardson mentions the above feat (*Expeditions* 1848–51) with some doubt as to the identification of the bird. Captain Nares took some in 1875, but they all died during the first winter, and he considered

it useless to attempt communication in this manner in a country entirely new to them, and in which they would suffer greatly from cold and absence of food.—[Ed.]

In the evening I got my first moon culminations.

We sent up two more balloons loaded with papers containing information as to our locality and the deposits of the provisions; and with a small mortar I measured a base by sound, so as to give a temporary scale to my plan of the harbour. We had a strong wind from the east, with the barometer as low as 29·34 inches on the 10th, which induced us to spread our main deck housing the next day.

A native visited us on the 14th, bringing with him two trout. The ptarmigan appeared in large packs on the 17th, affording our people good sport and several good meals. We began now to have a difficulty in making our way through the sludge ice to the shore, but it was the 21st before we could walk from the ship, and on the following day I measured a base on it. Two more balloons were sent away on the 23rd, which after hovering about some time, took a S. by E. direction.

On the 24th of October we cut the ship into 5 fathoms of water, 300 yards from the shore. Our first fox was trapped the next day, and turned adrift with a collar on his neck.

On the 27th of October, the sea ice being strong enough to bear our sleighs laden, I set out provisioned for ten days, with the view of examining South Bay, in the south-east corner of which was a bight that Mr. Skead had not seen the bottom of. Mr. Parkes accompanied me with another sleigh and three days' provisions, to bring the wood stacked by Lieutenant Jago. We got our sleighs across the isthmus without much difficulty, having more trouble in crossing the lakes than in any other portion of our route, the ice on them being so slippery that it was almost an impossibility to walk except in moccasins. Our dogs, however, made up for it, three of them dragging the sleigh themselves when we arrived at a smooth tract.

We reached the sea ice in two and a quarter hours, and as we continued our route towards the mouth of the harbour, we

met with two sleighs and nine Huskis, including children, and purchased a small quantity of venison from them. We found this arm of South Bay to be eight miles long, running north and south, with several islets and many coves, affording harbours within harbours. On arriving at its junction with the inlet Mr. Skead had examined, we found the ice all in motion, and several pools of water close to us. Getting our dinner under a cliff head at the east side of the entrance, we set forward again, but almost immediately fell into a crack; the dogs refusing to jump baulked the sleigh, and thus we got our clothes and some of our provisions wet, so were compelled to camp where we were and dry our skin dresses and blanket bags as best we could. Driftwood being scarce, and our fire an economical one, we succeeded but indifferently.

Setting out again the next morning, we got two miles round the point, when the ice became so rotten that the sleigh sank through, and I began to fear we should lose all; however, by quickly unloading we got it to a firmer spot, and then, seeing that we could not proceed at present without great hazard, I had to give up my excursion. So taking two men with me I ascended the highest hill near, and got a round of angles, sending the sleigh back to our last night's camping place. After joining them and getting some refreshment, we started homewards, reaching Mr. Parke's encampment at 7 p.m., who, I found out, had got a large stock of wood together, with part of which we got up a good fire, and got our blanket bags thawed.

On our route to the ship next morning we found the Huskis camped in snow houses on the banks of one of the lakes, where they were now employed fishing; having cut holes through the ice and attracted the fish by some glittering object, it was speared. Some they had procured thus were ten and twelve pounds weight, two of which we purchased for an awl and two needles, and found them to be salmon trout, and capital eating.

The next day, Mr. Phayre went part of the way across the isthmus with the sleighs and dogs, where he met Mr. Parkes, and getting a load of firewood from him, returned at 4. Four

natives (a portion of the party encamped on Isthmus Lake), came on board. One, an old man, rather infirm, and compelled to go about with two sticks, had begged hard for a boarding pike, which I had promised him if he would come on board, and now I gave him his choice either of that or a knife; the latter was preferred. His name was *Ip-pee-ra*, and he appeared to be the leading man of this portion of the tribe. Two of the party with him were his sons-in-law, and the fourth was his wife; far from a handsome specimen of her sex, but uncommonly desirous of picking up the wee things about the decks. The party altogether amounted to twenty-five individuals.

Prevailing winds during the month of October, 1851:—

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4½ | ½ | 4½ | 7¾ | 9 | 1 | 1½ | ¾ | 1¾ | ½ | = 31 days. |

An hourly register of the tide pole, and a two-hourly register of the barometer and thermometer, was commenced at this period.

*November 1st.*—On Saturday Mr. Phayre brought over another load of firewood, and Mr. Parkes and his party returned.

On Sunday the natives again visited us, and remained at first very quietly during Divine Service, but went away before it was concluded. We got all our wood across by the 4th, consisting of six sleigh loads in all. On the 5th I went with a sleigh to the north side of the harbour, in order to connect Mr. Parkes' survey with mine.

On our route we found the natives encamped near our first anchorage. The snow houses have certainly a very clean and comfortable appearance when first built, but they soon get abominably filthy. During the following day they were joined by another portion of the tribe whom we had not yet seen, and among these men we found a small axe and part of a pemmican tin, which showed they were the party who had met with the *Investigator's* people in the spring.

On the 7th of November they crossed the bay to the southward, and built their huts on that side, about three miles from the ship, mustering in all eight sledges. They visited

us on the 8th, and we tried to tempt them with saws and knives to part with some of their venison, but only succeeded in getting a small quantity for our dogs. They evidently had not been successful this season, and had nothing to spare. Some among the tribes were of very different features to the others, the face being oval and the nose aquiline. They numbered between forty-five and fifty all told, and had with them children of all ages.

We now began to build snow walls about the ship, to protect her in some measure from the drift, and banked her sides up as high as the sponsons. On clearing our fore-peak, we had the discomfort to find the dry rot making its appearance, and had to cut away to sound wood in many places. A regular system with regard to the washing of our clothes was commenced, and carried through the winter, by devoting one day to each quarter watch, and one day to the officers. We managed to dry by far the greater portion round about the hot air pipes in the main hold. The men always brought what they had washed to divisions in the morning, which ensured their having a clean suit weekly, and also that they were thoroughly wrung. Having a spare cabin on the port side of the lower deck, it was devoted to the airing of the bedding, each man's bed-clothes being spread daily in rotation.

The sun disappeared on the 18th of November, and our daylight fast failing us, the quarter-deck housing was spread on the 22nd. We kept ourselves supplied with lake ice for water by means of our dogs, the sleighs making from one to two trips daily according to the weather. The school was established the last week in the month, one watch being permitted to attend in the forenoon, the other in the afternoon, while two petty officers were appointed to assist any who might choose to improve themselves as tailors and shoemakers.

Both natives and deer appear to have left us, and scarcely any ptarmigan or hares are to be seen. Notwithstanding all the labour and fatigue, our deer-stalking proved unsuccessful, and we were without venison for our Christmas fare; which, judging by our first essay in August, I certainly had expected.

Nor did we see that the natives killed more than one. During October, scarcely a day passed without their being fallen in with, but they seldom permitted approach within rifle-range.

The bitch we had brought from the *Plover*, pupped, producing a litter of nine, six of which we kept, but one being overlaid by the mother was killed. The other five promised well, although we could not anticipate being able to use them as a team in the spring.

Prevailing winds during the month of November, 1851:—

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 1½ | 1 | 4½ | 11½ | 2 | 0 | ½ | ½ | ½ | = 30 days. |

*December.**—In December the practice of sending all hands out for a walk on Thursday forenoons was commenced, while the afternoon of the same day was given to them to make and mend their clothes. Mercury froze on the 10th, and afforded us an opportunity of correcting the scale of our thermometers, none of which agreed, and some were twenty degrees in error. Finding a lack of occupation, a skittle alley was built of snow alongside, which soon became a favourite resort, affording not only healthy exercise, but giving them something to do of their own accord. Sometimes coming off from the observatory, with the temperature below −30°, I have heard the balls rolling at midnight. Our daily routine of duty dwindles into little more than bringing ice from the lake, clearing away snow-drift, cutting out the tide and fire-hole, and getting up provisions. Three foxes were trapped and turned adrift with information.

Christmas came to enliven us with its cheering recollections, and I had the satisfaction to find but two men sick, only one of whom (the sergeant of Marines, suffering under a disease of the chest, and who had been three months under medical treatment), was unable to do justice to the double rations which our ample supplies permitted me to issue.

The game list since leaving Port Clarence showed as follows:—

3 bears, 1 deer, 45 hares, 21 foxes, 4 seals, 524 loons, 21 gulls, 4 ducks, 29 ptarmigan.

* See Note 25, Appendix.

Two ravens visited us occasionally and apparently were now the only living beings left except the foxes.

Prevailing winds during the month of December, 1851.

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 8¼ | ¾ | 2¼ | 2½ | 4¾ | 2 | 2¾ | 2 | 1 | 4¼ | = 31 days. |

A very remarkable feature is the height of the barometer (mean 30·85) on the three last days of November and the two first days of this month.

*January* 1852.—On New Year's Eve it was announced that the Wollaston Theatre would open on the following Thursday, and accordingly our dramatic performances commenced on that day. Our mustard and cress seed was also sown. Some hares having been seen, the game laws were relaxed, and an arrangement made that two men from each mess in rotation might go out, the proceeds of the day's shooting belonging to them, instead of going to the general stock. This answering well both as an inducement to take exercise, and adding every now and then something to their allowance, one of the empty snow huts on the south side of the Bay was cleared, and a *cache* made of a buffalo robe, fuel, and a small quantity of provisions, that any parties caught in a snow drift, or otherwise prevented from returning to the ship, might have a place of refuge. On the 17th the daylight had so far returned as to induce me to have my skylight cleaned of the frost and a double sash fitted, by which means I had the satisfaction of putting out my lamp for an increasing period each day; and being the only part between decks, where the daylight yet could be admitted, it proved a comfortable change to the sergeant of Marines, who was still incapable of taking exercise on deck. The sun made its appearance at the flagstaff on the 24th January. Three deer having been seen, and our shooting parties frequently bringing in something, gave us great encouragement; so much so that I had to issue stringent orders relative to the period of their return. Our theatre also having once been set going, and the bills printed by the press, supplied from the Hydrographic Office for our balloon papers, succeeded better and better each representation, and

Thursday night began to be looked to with some expectation. Two wolves walked across the Bay on the 28th inst. Our mustard and cress would not come up, and one of our pups was killed by falling down the hatchway.

Prevailing winds during the month of January, 1852.

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 10½ | 1 | 2¾ | 2¾ | 4½ | 1 | ½ | ¾ | 2½ | 5 | = 31 days. |

*February.*—A trap was fitted with slabs of ice, after the plan mentioned in Captain Lyon's narrative (1823), in hopes of catching the wolves, who we were desirous should not interfere with our manorial rights as far as the hares were concerned, and we attributed our success in shooting in some measure to the fact of having either caught or dispersed all the foxes. Some experiments on the velocity of sound, at the temperature of −36°, were made on the 11th, and on a trial of some of our rockets, which had been exposed to the cold throughout the winter, they proved useless as well as one brought from our magazine.[20]

[20] EFFECTS OF COLD.—*Sound.*—Captain Parry in his third voyage (to Prince Regent's Inlet) mentions the carrying on of conversation at a distance (over ice) of 1·2 miles, thermometer being 18° Fahr., barometer 30°, weather calm; owing, he considered, to the homogeneity of the air (but something is probably due to reflection from the ice). He found that the velocity of sound decreased at low temperatures: and from − 41° to + 33° the velocity increased 1·126 ft. per 1° Fahr. (*Arctic Manual.*) This law was somewhat confirmed in the second German Expedition to E. Greenland, Jan. 28, 1870, at a temperature of −6·2° Fahr., the velocity was 321·58 metres per second; and Feb. 20, temp. −29° Fahr. the velocity was 317·52 metres per second. In the winter of 1882–3, at Fort Conger (Discovery Bay, *Greely Expedition*), a good many careful experiments on velocity of sound were made with firearms in good weather at a distance of 4197 feet, and at temperatures from about zero to −50°. The results (given in the record of the expedition) are too irregular to determine from them any precise law, but there was a distinct decrease in velocity as the temperature decreased; the rate of decrement, however, appeared to fall as the temperature fell, and at zero the velocity was about 1070 feet per second, and at −20° about 1030 feet, and at −40° about 1010 feet; below that temperature it was about 1000 feet; Lieut. Greely heard words at a distance of two miles.

*Refraction in Cold.* M'Dougall (*Resolute* 1852) gives an observation of high refraction at the low temperature of −18°.

| | | |
|---|---|---|
| Nov. 4.—Apparent altitude of the sun | 9′ 30″ | |
| True position (ditto) .. .. | 33′ 23″ | below horizon. |
| Actual refraction .. .. .. | 42′ 53″ | |
| Normal refraction .. .. | 32′ 6″ | |
| Increase due to temp. .. .. | 10′ 47″ | |
| The same by 2nd observation | 13′ 33″ | |

*Scent in Cold.*—Osborn (*N. W. Pass*) remarks, as other Arctic travellers have done, on the favourable conduction of scent in low temperatures.

*Freezing of Liquids.*—Lieut. Greely tried experiments on the freezing of various liquids.

| | | | |
|---|---|---|---|
| Brandy exposed to temperature .. | −55° Fahr. | | Froze solid in an hour. |
| Nitric acid (ditto) .. .. .. | „ | „ | „ „ |
| Spirits of turpentine .. .. .. | −59·4° | „ | Deposited a sediment, and became viscous. |
| Sulphuric ether, concentrated .. | „ | „ | Formed small crystals. |
| Muriatic acid .. .. .. .. | „ | „ | Unchanged. |
| Rum .. .. .. .. .. .. | „ | „ | „ |
| Pure alcohol .. .. .. .. .. | −55° | „ | „ |

The daylight rapidly increasing enabled our shooting parties to extend their range, the hares about us having been all picked up. The theatre continued to be maintained weekly with spirit, and gave great satisfaction; scenery we could not boast of, but the dresses were very well got up, and showed what human ingenuity will contrive when put to it.

Some very brilliant displays of the *Aurora* (which I have not before noticed, preferring to bring all our observations on this subject under one head) occurred.[21]

[21] Aurora Borealis: see Appendix.

Generally speaking, the appearance of this beautiful phenomenon here, was in the shape of light fleecy clouds, instead of the brilliant streaks, which was the distinguishing feature at Port Clarence. With us it sometimes shot up from all quarters of the compass to the zenith, forming a most magnificent canopy, through which, however bright, the stars might be seen. I can only compare it to an enormous tent, the curtains of which were continually in motion, and as constantly changing their brilliancy. On one or two occasions the brightness took a reddish tinge, forming

one of the most beautiful shades of colour I have ever seen. Occasionally it appeared quite close to us, and the rapidity with which the intensity of light passed from one portion to the other was wonderful; but I never heard, nor did I ever hear, that any other person had detected any noise accompanying it.

Prevailing winds during the month of February, 1852.

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 9¼ | ½ | 3 | 3¼ | 2¾ | ½ | •1¼ | ½ | 3½ | 4½ | = 29 days. |

On *March* 1*st* the snow melted for the first time this year on the ship's side. The wolves occasionally visited us, and at night came close up to the ship, but were wary enough to avoid our traps. They however enticed our Newfoundland dog, Neptune, away, and finding he was on too good terms with them it became necessary to tie him up. On the 14th of March we trapped one of our former captive foxes whose collar proclaimed that he had been turned adrift on the 20th of December. We tried to keep three of them, but one after the other either the dogs got in and worried them, or they strangled themselves in the endeavour to escape. On the 16th, the daylight exceeding half the twenty-four hours, we sent up two balloons which both took a southerly direction. The ravens being the last to leave, so were the first to return, coming back on the 17th. By letting panes of glass into the sides of our main deck housing, we had obtained a very good light; but although the thermometer was still very low, we were not quite satisfied until we got the quarter deck housing away, which was removed on the 23rd March, and let a gleam of sunshine down the main hatchway on to the lower deck. On the 25th I turned the people out for a little practice with the small arms at a target, but it was cold work. The theatre closed finally with great applause on the 18th, our occupations now calling for the employment of all hands, in preparing our sleighs and removing the snow walls. During the month the carpenter cut a hole in the ice round the ship's bow, which after two failures, at length permitted him to replace the iron plates there; the lowest distance we could safely go in the ice

without endangering the water bursting through on the tide rising was 4 feet 2 inches.

As a reward for attention in school, and general good conduct throughout the winter, I issued six pairs of knitted hose, six pairs of mitts, and eight clasp knives.

Prevailing winds in the month of March, 1852.

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | ¼ | ½ | 4 | 2½ | 1¼ | ½ | ¼ | 2¾ | 3 | = 31 days. |

The barometer during the 1st of March stood at one time at 31·1 inches.

## SECTION X.

### EXPLORING PARTIES.

### SPRING, 1852.

*April.*—I was in hopes that the relays for our provisions in aid of the travelling parties might have been laid out before this period, but the latter part of March proved very cold; the monthly average being lower than any of the preceding ones. A decided improvement in the weather took place on the 1st, and as we were all prepared, a move was made on the 2nd. Lieutenant Jago proceeding to Point Wollaston, Mr. Phayre accompanying him for two days, and I went over with them to South Bay so as to lighten the load across the land.

*3rd.*—The following morning I again started, this time inland. with a view of gaining the eastern watershed, and if possible to get sight of the sea in that direction. A fatigue party accompanying us for the first ten miles, we took an easterly course up the valley at the head of the bay, which in some places became very narrow, between high precipices of lime stone. The snow drift under them being occasionally so steep, that we had a difficulty once or twice in getting the sleigh along. As we surmounted the gorge the plain became more open with numerous lakes, the ascent and descent into some of which were very precipitous; and we finally camped under the lee of a snow drift, on the banks of one of them at 5.30 p.m., having come nineteen miles. In the morning a fresh easterly wind prevented our moving until 8 a.m., when it lulled a little, and we set forward; being, however, compelled to make two trips with our load up the sides of the lake. The general height of the table-

land, on which we now found ourselves, was 700 feet, strewed with sharp stones which cut up the runners of our sleigh. The fear of damaging it, together with the difficulty we experienced in dragging it up the steep slopes, determined me to leave it, and pursue our route as far as a day's journey would admit. Setting out at 10.30, with a theodolite and three men, we took a north-easterly course, and after a five-mile walk, came to a large lake, which took us two hours to cross. Ascending a high hill on its eastern border, we had an extensive view of the surrounding country; which presented a dull tameness, few of the hills rising 500 feet above the plateau, and all save a few black spots here and there covered with white, which so dazzled the vision, that we could not even accurately ascertain the limits of the lake below us, although the atmosphere was perfectly clear. It was, however, by far the most extensive lake we had yet seen, and appeared nearly separated into two parts by a long isthmus. Recent tracks of seven deer were passed, and we also came across Esquimaux landmarks.

*5th.*—Taking a south-easterly direction the following day, and going over a succession of lakes and hills for fourteen miles, we got no reward for our trouble; the country presenting one uniform appearance, with scarcely a distinguishing feature to mark our route; in fact, upon our return we were compelled to keep upon our own trail. Neither to-day nor yesterday could I detect any signs of an easterly watershed; in a few instances the lakes communicated one with the other, but usually speaking they were isolated. Returning to our camp, we moved the greater portion of our load over the most difficult portion of our journey, and setting out early on the 6th, reached the ship at 3.30 p.m. We found our three dogs of great use; and a light cooking-stove made by the armourer, and fitted for some of the copper kettles Sir J. Richardson had advised our being supplied with, answered admirably.

Lieutenant Phayre had returned I found on the afternoon of the 4th; and Mr. Parkes was despatched on the following morning, to make a deposit of provisions on Bear Island

Point, for the convenience of the northern expedition. Two balloons were sent up on the 6th of April, which took a north-westerly direction, but were not seen by any of the parties that were out.

Lieutenant Jago returned from Point Wollaston at 1.15 p.m. on the 7th of April. He reported the sea ice to be very fair travelling, except near to the shore on the south side, where it was so thrown up in hummocks, that he was compelled to unload his sleigh, in order to get to the shore. When, however, inside the hummocks, sufficient space of smooth ice was found between them and the shore, which enabled him to keep it on board, at the expense of following all its sinuosities. He also reported that the drift-wood was plentiful on that shore. In the afternoon the wind freshened from the eastward, and I did not think Mr. Parkes would return that night. He, however, made his appearance at 10.30 p.m. with one man on the sleigh, and the remainder very much exhausted. It appears they had come the whole distance (twenty-five miles as the crow flies) from the deposit at Bear Island Point since the morning, and from want of forethought, having no fuel, had suffered much from thirst.

Our sick list swelled at once to eighteen, principally snow blindness, which soon yielded to the doctor's treatment; besides that there was not one who had been selected for the coming travelling parties that would have been left behind. In fact, the feeling was very general throughout the ship, and all I believe were desirous to go.

On the 8th, 9th, and 10th of April, it blew a gale of wind, causing us all to congratulate ourselves that we were comfortable on board, and not uselessly expending the provisions for our journey. Each party made such alterations in their equipment as the short experience of the recent trips devised.

## SLEDGE EXPEDITIONS.[22]

[22] SLEDGE TRAVELLING: see Appendix.

THE SOUTHERN EXPEDITION, consisting of the *Victoria* Sleigh, under Lieutenant Jago, was directed to examine the coast

southerly, and ascertain if Prince Albert's Land was joined to Wollaston; while the main object of the expedition was never to be lost sight of; and in the event of coming in contact with the natives, they were to be examined, and care taken to see whether they had been in contact with Europeans, or had got anything belonging to the missing ships about them.

He was equipped with the following provisions and stores, which were ample for forty days:—

Tent, buffalo robe, raccoon skin and floor-cloth, 5 boarding pikes, 8 blanket bags, 3 kettles, 1 musquet, 2 fowling pieces (private), 3 axes, 1 saw.

*Provisions.*—Pork, boiled, 160 lbs.; preserved meats, 160 lbs.; pemmican, 72 lbs.; biscuit, 320 lbs.; potatoes, 240 lbs.; rum, 12 gall.; sugar, 60 lbs.; tea, 12 lbs.

Without rum = 3·2 lbs. per man per day. Without tea and sugar = 3·0 per man per day.

Making a total, including casks, cases, and clothing, of rather more than 14 cwt.

His crew consisted as follows:—

| Name. | Rating. | Weight. | |
|---|---|---|---|
| | | On leaving. | On return (48 days). |
| | | lbs. | lbs. |
| 1. Lieut. Jago . . . | . . . . . | 143 | 135 |
| 2. Geo. Fowler. . . . | Quartermaster . . | 155 | 149 |
| 3. Thos. Cousins . . . | Captain, Maintop . | 181 | 175 |
| 4. Richd. Thomas . . . | A.B. . . . . | 173 | 160 |
| 5. Alfd. Bail . . . . | A.B. . . . . | 165 | 151 |
| 6. Geo. Burns . . . . | A.B. . . . . | 160 | 144 |
| 7. Jos. Wiggins . . . | A.B. . . . . | 145 | 139 |
| 8. Geo. Deverell . . . | Marine . . . . | 190 | 170 |
| | Total . | 1312 | 1223 |

Each man provided himself with, 1 pair of shoes, 1 pair of boot hose, 2 pairs of stockings, 1 pair of mitts, and 1 pair of knitted drawers, and 1 knitted frock for every two men, in addition to what they had on.

*Monday, 12th April.*—Proving fine, they left the ship at

6.40 a.m., Mr. Phayre accompanying them with the *Investigator* and *Assistance* sleighs for two days; while I as before crossed the Isthmus with them, and lightened the load as far as South Bay. They started in good spirits, and I felt assured nothing would be left undone to fulfil my instructions.

As I returned, the first snow-bunting flew past, which I hailed as the harbinger of spring and good omen.

On the 14th of April a seal came up on the ice for a bask in the sun; but he was too wary even to let our people within rifle range. To-day also the water ran off our housing; and after getting observations for time, I embarked the transit instrument, thus concluding a series of very good observations, which comprise forty-nine nights, on which the transit of the moon and stars was obtained.

On the 15th the main deck housing was furled, and the light admitted down the fore-hatchway on to the lower deck. Mr. Phayre returned at 2.30 p.m., having left the southern party all well.

### NORTHERN SLEIGH EXPEDITION.

The *Resolution* and *Enterprise* sleighs were loaded and ready for a start in the morning. The northern expedition, consisting of these two sledges (one of which, the *Enterprise*, was under my own direction, the other under that of Lieutenant Parkes), was intended to push through the Prince of Wales Straits; and separating at the northern end, Mr. Parkes was to attempt to reach Melville Island, while I examined the north face of Prince Albert's Land, towards Cape Walker. As we might calculate upon supplying ourselves from the *Investigator's* depôt at the Princess Royal Islands, our loads were not quite so heavy as the *Victoria's;* but as I had seen no bread there, it was necessary to take the whole allowance of that article for forty days.

*Stores.*—Tent, buffalo robe, raccoon skin, floor-cloth, 5 boarding-pikes, 8 blanket bags, 8 sealskin boots, 4 haversacks, 3 kettles, 1 fowling piece, 2 musquets, 2 axes, 2 saws, 1 stove.

*Provisions.* — Pork, boiled, 160 lbs.: preserved meats, 40 lbs.; pemmican, 108 lbs.; biscuit, 320 lbs.; potatoes, 110 lbs.; rum, 10 galls.; sugar, 40 lbs.; tea, 5 lbs.; cocoa, 20 lbs.; flour, 25 lbs.; fuel, 100 lbs.; dogs' food, 40 lbs. Making a total of 13 cwt. for each sleigh (including cases).

The crew of the *Enterprise* consisted of:—

| Name. | Rating. | Weight. | |
|---|---|---|---|
| | | On leaving. | On return (52 days). |
| | | lbs. | lbs. |
| 1. Capt. Collinson . . . | . . . . . | 134 | 131 |
| 2. Henry Hester . . . | Capt., Coxwain (July 1st, 197 lbs.) | 187 | 172 |
| 3. Wm. Gowan . . . | A.B. . . . . | 167 | 166 |
| 4. Wm. Murray . . . | A.B. . . . . | 170 | 160 |
| 5. J. E. Davidson . . . | A.B. . . . . | 140 | 134 |
| 6. John Charters . . . | A.B. . . . . | 154 | 141 |
| 7. Geo. Bosquet . . . | A.B. . . . . | 162 | 152 |
| 8. Wm. Marshall . . . | A.B. . . . . | 150 | 149 |
| | Total . | 1264 | 1205 |

And the three dogs—Daddy, Sandy and Joe.

The *Resolution* was manned by:—

| Name. | Rating. | Weight. | |
|---|---|---|---|
| | | On leaving. | On return (75 days). |
| | | lbs. | lbs. |
| 1. Lieut. Parkes . . . | . . . . . | 149 | 149 |
| 2. Jas. Rich . . . . | B. Mate . . . . | 163 | 158 |
| 3. Wm. Smith . . . . | Quartermaster . . | 147 | 138 |
| 4. Wm. French . . . | A.B. . . . . | 181 | 170 |
| 5. Wm. Jefferson . . . | A.B. . . . . | 166 | 160 |
| 6. W. Wilson . . . . | A.B. . . . . | 183 | 161 |
| 7. Thos. Bryan. . . . | A.B. . . . . | 165 | Not weighed |
| 8. Wm. Cooper . . . | A.B. . . . . | 180 | 165 |
| | Total . | 1334 | |

Each provided himself, in addition to the clothes he had on, with 1 pair shoes, 1 pair boot hose, 2 pair stockings, 1 pair mitts, and 1 knitted frock, and 1 pair of drawers for every two men.

Before I proceed to give my own journal in detail, and abstract the reports I have received of the other parties, the meteorological register and the transactions on board the ship during the latter part of April and the month of May will be entered.[2]

See Note 2, *Meteorological Observations.*

The ship's company being reduced one-half, the port mess tables were removed, as well as the school table; and the issue of biscuit in lieu of flour commenced. The carpenters were occupied in shipping the skid beams over the quarter-deck; and overhauling the bends, which we found much splintered by the ice of last year. Part of the deck under the galley being found unsound, it was replaced. Three small balloons were sent up on the 21st, which took a northern direction. Towards the end of the month a shooting party provided with a tent was established about 4 miles from the ship.

The weather was fine enough on the 28th for the housing to be spread to dry. Two small and one large balloons were sent up on the 30th, which went away to the north. One of our pups was missing, and supposed to be carried away by the wolves. On the travelling parties leaving, the game laws were re-established.

*May.*—The forecastle housing was removed on the 3rd, on the afternoon of which day a heavy fall of snow occurred. The carpenters were employed caulking the upper deck and the bends; and the ship's company bringing the running rigging on board from the house. One of the sheet anchors was got on board, and put down the main hatchway.

Two balloons were sent up on the 7th, which took an easterly direction. The first deer was killed on the 14th, and according to an arrangement I had made, the whole of the first and half the second were to be the property of the persons killing them. In this instance the two men who got it, Kimble and Mayew, waived their claim, and it was divided among all hands, weighing 43 lbs.

*May 14th.*—At 10 p.m. William Driver (ship's cook) de-

parted this life. He had been suffering from general debility, and was too old a man for such an expedition; but being an old shipmate of mine, and considering that the duty he would have to perform would not call for much exposure, he was entered. I had left him very ill, and scarcely could hope ever to see him again. On Sunday afternoon Mr. Phayre performed the melancholy duty of consigning his body to the earth; a grave being dug on the top of the hill, not far from the flagstaff.

Two balloons were sent up, one of which apparently dropped near at hand, the other took a northerly direction.

The head of the mainmast was got aft 0 ft. 10 in., and the mizenmast 1 ft. 2 in., which I thought would improve her staying in a sea way, the only fault we had to find with her. On the 25th May another fox with a collar on his neck was trapped; and the same evening the Esquimaux encamped on the ice about 2 miles from the ship. On visiting them they were found to be the same party that had left us in November. After visiting the ship the next day they removed their encampment to the westward.

The starboard foreyard arm being found sprung, it was got down and fished.

Prevailing winds during the month of April, 1852:—

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 2¼ | ¼ | 9 | 8½ | 1¼ | ½ | 1¼ | ½ | ½ | = 30 days. |

During the month of May:—

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 9¼ | ¾ | 1¾ | 6 | 6¼ | 1 | 1 | 0 | 3½ | 1½ | = 31 days. |

## Sledge Journal, North.

(*Journal while absent from the ship with the Enterprise sleigh.*)

*Note.*—The symbols here used are those often adopted by observers for the days of the week; they are taken from the planets, and signify as follows: ♀ Venus, Friday; ♄ Saturn, Saturday; ☉ Sunday; ☽ Monday; ♂ Mars, Tuesday; ☿ Mercury, Wednesday; ♃ Jupiter, Thursday. The wind numbers and the weather letters are those of Sir F. Beaufort's scales, which are now generally used.—[Ed.]

♀ *April 16th.*—*Winds*—E.S.E., 2–4. *Weather*—b.c.–b.c.q.

*Made good*—Course, W. Distance, 13·4 miles.

*Distance traversed*—17 miles. Hours under weigh, 8.40.

The *Resolution* and ourselves left the ship at 6.40; accompanied by a fatigue party of nine men, who returned to the ship at 12.15. We camped on Pemmican Point at 4.30; about which the ice was thrown up in hummocks. Mr. Parkes, who had left us at noon to shoot, returned with a hare at 5.30. The period of our meals, and the allowance per man, were arranged as follows:—*Morning, before starting,* 1 pint of cocoa, ½ lb. of biscuit, ¼ lb. of pork. *Noon,* ¼ lb. of biscuit, ¼ lb. of pork, ½ gill of rum. *Night, after camping,* ½ lb. of preserved meat, ⅜ lb. of preserved potatoes, 1 pint of tea, ½ gill of rum, ¼ lb. of biscuit. In addition to which I usually added, unless something had been shot in the course of the day, ⅛ lb. of pemmican, which added to the flavour of the preserved meat, and likewise filled our kettle.

♄ *April 17th.*—*Wind*—S.E., 2 to 4 and 6. *Weather*—b.c.m. and b.c.q.

*Made good*—Course, W. by N. ½ N. Distance, 11·6 miles.

*Distance traversed*—15 miles. Hours under weigh, 7.50.

Started at 6, came among hummocky ice at 7.30. Snow heavy. Hare tracks very numerous. Reached Bear Island Point (now Ramsay Island) at 12.30, and got to the depôt at 1.10 p.m. Here Mr. Parkes and Charters, who had left us in the morning to shoot, rejoined, bringing two ptarmigan with them. Picking up our provisions, and leaving one day's bread and potatoes for each sleigh, we set forward and got some large pieces of firewood. We halted for the night at 4.50.

☉ *April 18th.*—*Wind and Weather*—3, b.c. 1, b.m.

*Made good*—Course, N. ½ W. Distance, 8 miles.

*Distance traversed*—12 miles. Hours under weigh, 9.

Left camp at 6.50. Drag heavy, particularly to *Resolution.* Gave her the dogs at noon. Ice thrown up in hummocks to seaward of us, and many cracks across our track, into which the sleighs frequently fell, notwithstanding all our care. Fortunately, although so heavily laden, they sustained no

damage. Camped at 4.50. Mr. Parkes shot two ptarmigan. Gowan and Davidson affected with snow-blindness.

☽ *April 19th.—Winds and Weather*—o.o.s. S., 2, b.m.

*Made good*—Course, N. ½ E. Distance, 8·5 miles.

*Distance traversed*—12 miles. Hours under weigh, 9.

Started at 7. Many cracks in the ice, but the drag not so heavy as yesterday. At 5 p.m. we camped in sight of the mark that was put up where we landed on the 28th of August. Mr. Parkes got three ptarmigan.

♂ *April 20th.—Winds and Weather*—S. 4, b.c.m. S. 6.

*Made good*—Course, N.E. Distance, 7 miles.

*Distance traversed*—13 miles. Hours under weigh, 7.45.

Left camp at 6.30, reached the mark at 7.35, got some driftwood, saw the marks of Huski tents, and also a camping spot of the *Investigator's* people. Shot a ptarmigan, and crossed the footmarks of a bear. Camped at 3.35 on a low islet at the entrance of a large lagoon, and about 3 miles beyond the spot where the party embarked on the 28th of August. *Resolution* did not come in until 5.35.

☿ *April 21st.—Wind and Weather*—N., 3, c.m.

*Made good*—Course, N.E. by N. Distance, 14 miles.

*Distance traversed*—17 miles. Hours under weigh, 10.

Moved 6.45. Road heavy, ice broken up in small hummocks, snow lying loose among them. Lost sight of the land at 10.40; saw it again at 2.15. Camped at 5.50, 8 or 9 miles from the shore. *Resolution* dropped two boarding-pikes: had to send back 3 miles for them. Snow on the ice 5¼ inches deep. Left eye affected with snow-blindness.

♃ *April 22nd.—Wind and Weather*—N.,6 to 8, o.m.q.

Thick weather, too inclement to move, remained in camp all day.

♀ *April 23rd.—Winds and Weather*—N.E., 4 to 6.

*Made good*—Course, N.E. by E. Distance, 15 miles.

*Distance traversed*—18 miles. Hours under weigh, 9.

Moved at 6.30. Better travelling, but bitter cold. Passed about 6 miles from a point at 10 a.m., and a second about 4 miles off at noon, came in with the shore opposite a large lagoon at 3.50. Got some driftwood and camped at 4.30

near a large boulder of greenstone. No rocks *in situ*. Hills entirely mud, strewed with limestone, greenstone and porphyry.

♄ *April 24th.—Winds and Weather*—N.E., 4 to 7, q.b.m.

*Made good*—Course, N.E. ½ N. Distance, 9 miles.

*Distance traversed*—11 miles. Hours under weigh, 5.20.

Squally weather; remained in camp until 8.10 a.m. Rich frost-bitten in one toe; wind very cold to the face. Camped at 2.30 on a long low spit on which cockle shells were numerous; firewood plentiful; snow-buntings seen.

☉ *April 25th.—Winds and Weather*—N.N.E., 5–7, o.m.q.

*Made good*—Course, N.N.W. Distance, 8 miles.

*Distance traversed*—11 miles. Hours under weigh, 5.30.

The weather being unfavourable we remained in camp until 12.30, and had divine service. At noon it cleared away a little, and then we found ourselves in a bight. On the cliffs above our tents and 40 feet above high-water mark, a pole 20 feet long was picked up. Camped at 6 under a bluff point.

☽ *April 26th.—Winds and Weather*—E., 7, 8 and 9, o.s.

Drift snow. Remained in camp all day. A bear passed half a mile from us at 9.30. We were in hopes the tents would have attracted his notice, and so kept quiet, but after taking a good look he passed on, and on being pursued took off at a rapid pace.

♂ *April 27th.—Wind and Weather*—N.E., 5, o.m. N., 6, b.c.

*Made good*—Course, N.E. by E. ½ E. Distance, 10 miles.

*Distance traversed*—17 miles. Hours under weigh, 9.

More moderate towards 7 a.m. Moved at 7.30. Got some driftwood, and entered the straits again at 9.50. Ice rubbly from 1 to 1½ miles from the shore. Camped at 5.30 about 4 miles from the land. *Resolution* arrived at 6.15.

☿ *April 28th.—Winds and Weather*—N.E., 5, b.c.

*Made good*—Course, N. Distance, 16 miles.

*Distance traversed*—20 miles. Hours under weigh, 11.

Moved at 7. At 7.30 caught sight of the Princess Royal Islands, found the ice much broken up 6 miles around

them. Pieces 4 ft. 6 in. thick turned up on their edges. The floe ice water worn, showing it had been exposed to the wash of an open sea for some time. Intervening spaces very slippery and transparent like fresh water ice. Got afternoon sight 2½ miles S. by W. from the island, which we reached at 7 p.m., and camped off the cliff head at the south end of the island. On visiting the depot we found nothing removed, although a bear and cub had been prowling round the island.

♄ *April 29th, Princess Royal Islands.*

*Winds and Weather*—N., 4 to 6, b.c.m.

*Made good*—Course, N.E. Distance, 10 miles.

*Distance traversed*—17 miles. Hours under weigh, 8.30.

At 5 a.m. we went to the depot and replaced the spirits we had consumed; besides each sleigh took of preserved meats, 120 lbs.; potatoes, 26 lbs.; sugar, 19 lbs.; cocoa, 8 lbs.; dogs' meat, 84 lbs.; completing our equipment to thirty-two days. We left behind one tin of pemmican and part of our ammunition. Having obtained observations for time, we left the island at 8.30, and for 10 miles found the ice much broken up, and the travelling with our heavy laden sleighs difficult, and camped on the ice about 7 miles from the shore at 5.45.

♀ *April 30th.—Winds and Weather*—Var., 2, o.m. f.s.

*Made good*—Course, N.E. by E. Distance, 7 miles.

*Distance traversed*—11·5 miles. Hours under weigh, 6.45.

Started at 6.45. Got in with the land at 10, and obtained some firewood; p.m. thick snow, unable to see our way; camped at 2.30 p.m.

♄ *May 1st.—Winds and Weather*—S., 1, b. S.W., 2, o.

*Made good*—Course, N.E. by E. Distance, 5 miles.

*Distance traversed*—9 miles. Hours under weigh, 10.15.

Snow-buntings seen; moved at 6.30; snow loose; very heavy travelling; noon overcast; nearly all the party blind. Camped at 5.45, after a hard day's work.

☉ *May 2nd.—Wind and Weather*—S.W., 4.

*Made good*—Course, N.E. by E. ½ E. Distance, 6 miles.

*Distance traversed*—10 miles. Hours under weigh, 10.50.

Started at 6.40. Better travelling than yesterday; passed bear and fox tracks; got in with the land, a low point, at 2.20, and left ten tins of preserved meats. Large pieces of driftwood here. Hester slightly frost-bitten. Camped at 6.30.

☽ *May 3rd.—Wind and Weather*—N.E., 4, b.c.m., N.E., 7, o.m.

*Made good*—Course, N.E. by E. Distance, 7 miles.

*Distance traversed*—11 miles. Hours under weigh, 9.15.

Started at 7.15, passed several hare tracks, and a deep bight at 9.30; came up to a point at 2 p.m., low coast line. Firewood of a large size. Camped close to the shore at 5.30. Murray's feet numbed; eyes better.

♂ *May 4th.—Winds and Weather*—N.E., 7, o.m.q.

Snow-drift; remained in camp all day; 5 p.m. more moderate; formed a *cache* of 50 lbs. of bread; 1 tin of pemmican; 28 lbs. of preserved meats; 18 lbs. of dogs' food; 20 lbs. of potatoes; 5 lbs. of cocoa; 8 lbs. of sugar, and 25 lbs. of flour.

☿ *May 5th, arrive at Peel Point?*

*Winds and Weather*—S.W., b.c.m., 4.

*Made good*—Course, E.N.E. Distance, 10·5 miles.

*Distance traversed*—15 miles. Hours under weigh, 10½.

Started at 6 a.m. *Resolution* parted company for Melville Island. Daddy and Sandy accompanied us, while Joe went with the other party. Hitherto we had taken the dogs day and day about, but Sandy and Daddy would not admit Joe to come near our tent, and some serious fighting took place in consequence, in which Joe got so severely bitten that he had not been in harness for five days. At 9 we passed a sharp peak, and at 1 we got among hummocks 20 feet high, evidently not this year's ice, through which we reached the shore with some difficulty, keeping on the land where the beach would admit of it; the sea-ice being so full of deep cracks that some serious falls were experienced; we camped at 5.30, and just before were much astonished by seeing six hares come trotting up to us. Not having seen any game

lately, the guns had been cleaned, but not reloaded, and while that was doing we kept the dogs as quiet as possible. One of them actually came within seven paces of us, when Mr. Daddy could no longer be restrained, but giving tongue dispersed them all; nor did we get one that night, although many excursions were made. On the mud cliffs, just over our encampment, were a great quantity of cockle shells, apparently recent, and therefore most likely carried up by the birds.

♃ *May 6th.—Wind and Weather*—N.E., 2, b.c.

*Made good*—Course, E. by N. ½ N. Distance, 12·4 miles.

*Distance traversed*—16 miles. Hours under weigh, 10.15.

Murray shot a hare; started at 6.30; ice hummocky the first four hours, then smooth; came to a low point at 11, and got some firewood, observed the meridian altitude, and afternoon sights for time; camped at 5.45.

☿ *May 7th, at Clumber Point?*

*Wind and Weather*—S.W., 3, b.c.m.

*Made good*—Course, E.N.E. Distance, 13 miles.

*Distance traversed*—16 miles. Hours under weigh, 10.5.

Started at 6.40 a.m.; got a.m. observations and the meridian altitude at noon. At 10.15 came in with pinnacle ice and deep snowdrift between; made for the land, and kept along it inshore of the hummocks, the hills having left the coast. At 2 p.m. we got sight of the *Investigator's* beacon. I found the stumps of two posts fourteen paces apart driven into the ground, a cable and a half from the beach; they were much weather worn. Drift-wood of a large size was more plentiful along this beach than we had seen elsewhere. We camped at the foot of the ridge, on which the beacon is, at 5.45. From it I got a round of angles and true bearing, and we left here 14 lbs. of preserved meats and 7 lbs. of potatoes. A large mass of ice (30 feet high) was laying aground off the point. Charters shot a ptarmigan.

♄ *May 8th.—Winds and Weather*—N.N.E., 3, o.m.

*Made good*—Course, N.E., 3. Distance, E. ½ S., 11·5 miles.

*Distance traversed*—17 miles. Hours under weigh, 10.30.

Started at 5.30; kept along the beach, against which high ice was upturned; raising the mud behind them into hillocks four and five feet high; no gravelly beach, as hitherto, but mud intermixed with sharp stones. Only one piece of firewood was picked up to-day. The ice hummocks appeared to be a favourite resort of the hares, either for salt licks, or on account of the grass seeds and willow leaves lodged among them by the wind. Murray killed two. Ice on the shore heavier than any we have yet seen; snow loose; ankle deep; travelling heavy; camped at five.

☉ *May 9th.—Winds and Weather*—W.S.W., 4, b.c.m.

*Made good*—Course, S.S.E. Distance, 9 miles.

*Distance traversed*—16 miles. Hours under weigh, 9.45.

Started at 6.45; came to a point at 9; hills here close to the shore; beach mud, upturned by the ice hummocks; no rolled stones; ice heavily packed off it. Got meridian altitude a.m., and p.m. sights for time. Camped at 5.20; hills ¾ of a mile inland. Some parts of this day's journey we were travelling over a lagoon, and oftentimes were at a loss to know whether we were on ice or land. Coast line tending to the south.

☽ *May 10th.—Winds and Weather*—W., 2, o.m.

*Made good*—Course, S. by W. Distance, 9 miles.

*Distance traversed*—15 miles. Hours under weigh, 8.

Started at 8.30; on the ground during the forenoon; hills ¾ of a mile inland and about 300 feet high. Afternoon on the ice; apparently a lagoon. The sea ice not so heavily packed on the shore as yesterday. Camped at 5.15. Made a *cache* of bread, 30 lbs.; potatoes, 14 lbs.; preserved meat, 6 lbs.; pork, 32 lbs.; rum all but six days.

♂ *May 11th.—Winds and Weather*—W., 4, b.c.

*Made good*—Course, S.W. by S. Distance, 9 miles.

*Distance traversed*—16 miles. Hours under weigh, 7.40.

Marshall shot two ptarmigan. Started at 7.30 over a lagoon; crossed low table-land at 10; got the meridian altitude. Halted at 4; hills 4 miles inland. Appearance of land to the eastward; got afternoon sights and angles.

☿ *May 12th.—Winds and Weather*—N.W., 2–4, b.c.m.

*Made good*—Course, S.E. by S. Distance, 13·5 miles.

*Distance traversed*—17 miles. Hours under weigh, 7.40.

Started at 8.20. Saw the land distinctly to the eastward and found we were in an inlet; got into the ice at 9, and took an easterly course. Camped at 4, inside some open hummocks, 20 feet high; recent bear tracks; got p.m. sights.

☌ *May 13th, at Glenelg Bay.*

*Winds and Weather*—S.W., 3, b.c.m.

*Made good*—Course, N.E. by N. Distance, 12 miles.

*Distance traversed*—14 miles.

Having determined to employ this day in exploring in both directions; I set out at 5.30 with Charters and Marshall to the north-eastward. A bear and two cubs crossed our track about half a mile off. They appeared to be working to and fro across the bay, as every 3 or 4 miles we again came on their trail. At 11.30 we were still on the ice, and about 8 miles distant from the point forming the east entrance of the bay, which I had hoped to reach, but finding that impossible, the meridian altitude and a round of angles were obtained from our present position.

*Made good*—Course, S. ½ W. Distance, 14 miles.

*Distance traversed*—16 miles.

Hester and Murray were sent up the bay. Having accomplished 14 miles they saw what they took to be an island opposite a cliff point, and the inlet now took an easterly turn. It is, however, very difficult to distinguish between low land and the water, they may therefore have been in the bottom of the bay. Gowan, Bosquet, and Davidson having during the forenoon cut a hole through the ice, which was found to be 6 feet thick, and the water 5¼ fathoms deep, went on shore in the afternoon, and put up a mark depositing information. Gowan then mounted the hills and corroborated Hester's statement relative to the trend of the inlet. The shore was 8 miles from us, much further than I had anticipated. Afternoon sights and true bearing were got.

♀ *May 14th.—Return.*

*Winds and Weather*—S. by E., 2, b.m.

*Made good*—Course, N. by W. Distance, 13 miles.

*Distance traversed*—17 miles. Hours under weigh, 7.55.

Started homewards at 9.35; got the meridian altitude and true bearing at noon. Camped at 4.30, and dug a hole in the ice, found it 5 feet 6 inches thick; snow on the top 1 foot 3 inches; depth of water 6½ fathoms. There must be a considerable space of open water here during the summer, as in our track we came across now and then water-worn pieces. Our bread being exhausted, we had none for supper.

♄ *May 15th.—Winds and Weather*—0, b.c.m.

*Made good*—Course, N. Distance, 14 miles.

*Distance traversed*—17 miles. Hours under weigh, 8 hrs.

Started at 7.45 Charters too ill to walk; put him on the sleigh; got to the shore at 8.45; no ice hummocks; reached our depôt of the 10th at 10.45. Ice now hummocky on the beach. Charters able to walk. Camped at 4.45.

☉ *May 16th.—Made good*—Course, N.N.W. Dist., 10 m.

*Distance traversed*—18 miles. Hours under weigh, 9.45.

Started at 6.30; ice heavily packed close to the shore in masses 30 feet high; reached camp of the 9th at noon, about which a bear had been prowling; got meridian altitude; a warm afternoon. Camped at 5.15.

☽ *May 17th.—Winds and Weather*—N.W., 4–6, b.c.m. W., 5.

*Made good*—Course, W. Distance, 11 miles.

*Distance traversed*—16 miles. Hours under weigh, 8.55.

Gowan killed a ptarmigan. Started at 7.15, and at 3.15 p.m. reached the *Investigator's* post. Picked up our preserved meats and potatoes, and got sights for time. Camped at 5.10, among abundance of firewood, being the first we had met with since the 8th.

♂ *May 18th.—Winds and Weather*—0, o.m. E.N.E., 7, o.m.

*Made good*—Course, W.S.W. Distance, 12·5 miles.

*Distance traversed*—17 miles. Hours under weigh, 8.50.

7.10, started; 8, came to hills close to the beach and a bight; 10.20, got on low land and obtained firewood; 11.45,

passed a point; 4, came in with low land again—hills 4 miles inland; 5, camped.

☿ *May 19th.—Winds and Weather*—E.N.E., 3, b.c.m. vble. s.

*Made good*—Course, W. by S. ½ S. Distance, 13 miles.

*Distance traversed*—18 miles. Hours under weigh, 8.30.

Started at 7.45, came on to the ice at 8.45, and passed a point at 9; got observations for time and true bearing. p.m. light fall of snow. Camped 5.15, under Depot Hill.

♃ *May 20th.—Return to Peel Point?*

*Winds and Weather*—S.W., 2, b.c. N., 1, b.c.

*Made good*—Course, W. by S. ½ S. Distance, 6·5 miles.

*Distance traversed*—9 miles. Hours under weigh, 4.15.

Bosquet shot a ptarmigan. I went to Depot Hill, 1 mile inland, 600 ft. above the sea, no rocks *in situ;* crossed the recent tracks of 5 musk oxen. Started at 8.20, and arrived at the rendezvous at 12.35. Gowan got a hare and 4 ptarmigan; Marshall, 2 hares, 2 ptarmigan, 1 snow-bunting; Murray, 1 ptarmigan.

We had sun enough now to take the frost out of our blanket bags, which were hung up to air. Being two days before the appointed time I had assigned for the return of the *Resolution*, we could look forward to as many days' rest.

*May 21st.—Winds and Weather*—E.N.E., 3, b.c.

Observations for time, true bearing and latitude were obtained. Having a good supply of firewood we got a comfortable wash and a change of clothes, the men washing their flannels. With our flour and pemmican cakes were made to eke out our bread, the frying-pan acting as a girdle. Men out throughout the 24 hours, but got nothing with the guns to-day.

♄ *May 22nd.—Winds and Weather*—E.N.E., 4, b.c. 6, o.m.q.

The snow melted on the sides of the large stones, enabling us to get a drink for the first time without a fire. Two men out shooting all day—crossed deer-tracks, but only got a

snow-bunting. The *Resolution* not arriving, it was my intention to have gone after her in the afternoon, but it proved squally.

☉ *May 23rd.*—*Winds and Weather*—S., b.c.m.

*Made good*—Course, N.E. by N. Distance, 18 miles.

*Distance traversed*—20 miles. Hours under weigh, 9.45.

Started at 6.15 a.m.; 8.20 saw a black object on the ice, which we took to be the *Resolution*. Leaving our sleigh we set out towards it at a rapid rate, when, much to our discomfort, it turned out to be a seal. Returning and picking up our sleigh we again set forward, getting the meridian altitude and true bearing. Saw a bear and 2 cubs. Camped at 5 p.m., about 7 miles from Baring's Land.

☽ *May 24th.*—*Winds and Weather*—S.S.E., 3, b.c.

*Made good*—Course, N.N.E. by E. Distance—13 miles.

„ „ S.W. by S. „ 13 miles.

*Distance traversed*—15 miles.

„ „ 15 miles.

The dogs barking at 4 a.m. roused us up in the hopes that it would prove to be our companions; on looking out, however, it turned out to be a bear. The musquets were outside the tent near the sleigh, but were soon got in and loaded with ball; Daddy in the meantime keeping the animal at bay, and annoying him so much that he frequently turned round with a spring. The dog had a narrow escape, as we found his back scratched by the claws. Sandy kept at a distance, which surprised us all, as he was generally looked upon as the first in the fray, and Neptune's principal antagonist. After 9 or 10 shots from Hester and Marshall, all of which took effect in the forequarter or muzzle, the great brute rolled over; but we should not have got him if it had not been for the manner in which Daddy stuck to him, as after the first two discharges he made off, and we were only able to get ahead of him again by the dog worrying him. When he fell he was three-quarters of a mile from the tent, and when we first saw him his footmarks were 19 paces from the door. Having cut off his head, and brought the sleigh for his carcase, we got it to the tent; and

then getting our breakfast I started at 6 with Bosquet and Gowan to the E.N.E., leaving the remainder to flay our prize. At 9.20 we came upon the meeting of two fields, the ice being raised in a continuous line as far as the eye could reach, into a ridge about 4 ft. high. At 10.20 we came upon the *Resolution's* second night's encampment after leaving the depot, about which a bear and foxes had been prowling. I then took an easterly course until 11.30, in hopes of crossing their homeward bound track. The day being fine we could see both shores very distinctly, and made no doubt but that Mr. Parkes would make for Prince Albert's Land at once, and in that case he might have passed to the south of us yesterday. Therefore, after straining my eyes in vain, and casting many a longing look in the direction of Melville Island, I turned back at noon, after getting the meridian altitude and a round of angles. We passed about 3 miles from a point on Baring's Land, the N.E. end of which is low and shelving. In walking back we found we could only make out the tent 6 miles off. After dinner I sent Hester and Davidson to the eastward, in hopes they might have come up since our return. They went 8 miles, but came back without seeing anything.

♂ *May 25th.—Winds and Weather*—E.N.E., 5, b.c.

*Made good*—Course, S.W. by S. Distance, 18 miles.

*Distance traversed*—20 miles. Hours under weigh, 8.20.

Building a pyramid of snow, and sticking the bear's ribs, with a small portion of firewood, on top of it, we set out at 7.10 on our return. The bear we found had followed up our trail 7 miles. We reached the depot at 4, but found no signs of *Resolution*.* I had made arrangement with Mr. Parkes that either sleigh was to wait 48 hours over the period allotted for the rendezvous, which was all our provisions would admit of. We had certainly the bear's carcase to fall back upon, but on examination of our stores I found we had but 15 lbs. of bread and 5 lbs. of potatoes left. In the *Resolution's cache* we found 28 lbs. of bread and

* Had we gone direct inshore instead of towards the depot, we should have fallen in with them.

21 lbs. of potatoes. To 8 lbs. of this latter we helped ourselves, to assist in taking us to the Princess Royal Islands.

☿ *May 26th.—Leave Peel Point.*

*Winds and Weather*—0, b.c.m.

*Made good*—Course, S.W. by W. ½ W. Distance, 13 miles.

*Distance traversed*—18 miles. Hours under weigh, 9.40.

Before starting at 6.50 many a wistful look was cast to the eastward. The day being fine we had a good view of the land, and found our depot was placed nearly in the centre of a long low beach. The hills receded inland 5 miles, then rising in two ridges to 700 and 800 ft. The meridian altitude and a round of angles were got. The track of several deer were passed, all coming from Baring's Land. Some ptarmigan and two seals were seen, as well as the footmarks of a bear, and numerous hare tracks, which appear to cross the ice in troops. Camped at 5.30 p.m., and got a small quantity of fuel.

♃ *May 27th.—Winds and Weather*—E.N.E., 2, o.m.

*Made good*—Course, S.W. by W. Distance, 11¼ miles.

*Distance traversed*—17 miles. Hours under weigh, 8.30.

Started at 7.20. Hills near the beach all the forenoon—a bight with hummocks of ice at 1 p.m. At 2 we came upon a long beach, which I recognised at once, and found we had missed our 10 tin depot. As it however consisted entirely of meat, our bear's flesh rendered us independent. It was palatable, but uncommonly tough. The smallest portion of its own fat gave it anything but a pleasant taste to me. Having got together all the firewood we could, we left the shore, and came in sight of the Princess Royal Islands at 3.30. Camped at 5.30. I suffered much from snow blindness.

♀ *May 28th.—Princess Royal Islands.*

*Winds and Weather*—E.N.E., 2, o.m.

*Made good*—Course, S.S.W. Distance, 11·5 miles.

*Distance traversed*—18 miles. Hours under weigh, 9.15.

The weather this morning, although overcast and misty,

was not too thick to prevent our object being seen and enabling us to make a straight course for it. One of the objects of my anxiety, the having to search for the islands in a fog, was removed. We got amongst the hummocky ice at 10; saw a seal and some geese, and reached the depot at 5.45, which we found had been visited by a bear, who had dug up the *Resolution's* depot, and scattered their boots about. The only thing belonging to us that he took a fancy to was Davidson's fiddle (which, being broken, we left behind upon the whale-boat's keel, beside our ammunition and pemmican tin). On tracing his footmarks, we found it about a cable and a half from the boat. We had 1 lb. of bread, and 1 lb. of potatoes left.

♄ *May 29th.—Winds and Weather*—W., 3, b.m.

Indifferent observations and meridian altitude were obtained, the weather being very hazy. Two of the lightest casks of flour were opened in hopes they might prove to be biscuit; but this not being the case, we set to work to make pemmican cakes. By eking out our fuel with turf, we managed to cook a mess of 9 lbs. of flour, 2 lbs. of potatoes, and 4 lbs. of pemmican, which I thought would last us as a midday meal to the ship. Both our pork and salt beef being expended, recourse was had to one of the *Investigator's* casks, which provided us with the latter, and fat for the frying-pan. The flagstaff was visited often during the day, in hopes of seeing the *Resolution*. The island I found to be limestone, abounding in fossils, thus presenting a strange contrast to the adjoining land, on which we had not seen a rock *in situ* since leaving the neighbourhood of the ship; and there, amidst abundance of limestone, we never got a trace of organic remains. One of the rum casks belonging to the *Investigator's* depot was, I regret to say, spiled, and I found two of my men drunk, which was extremely vexatious, as otherwise they had conducted themselves to my satisfaction.

⊙ *May 5th.—Winds and Weather*—N.N.E., 3, o.m. N., 6, o.m.

*Made good*—Course, S. by W. Distance, 15 miles.

*Distance traversed*—19 miles. Hours under weigh, 9.

Not seeing anything of the *Resolution* this morning, and finding if we remained another day, we must have recourse to the *Investigator's* casks for fuel, I determined on returning to the ship. More particularly as although I had specified no precise period for my return, yet I had told Mr. Phayre that most likely I should be back in the first week in June. In fact, Captain McClure's last notice on the Princess Royal Islands being dated on the 1st of that month, led me to suppose that the ice had began to move about that period. This was in some measure confirmed by seeing one or two burgomasters, and finding a water hole at the south point of the island. Leaving behind at the flagstaff a notice of our proceedings, and information for Mr. Parkes at the depot, we again helped ourselves from the latter, taking 76 lbs. of preserved meats, 15 lbs. of cocoa, 10 lbs. of sugar, 63 lbs. of potatoes, and 4 lbs. of flour. We started at 7.30. We got the meridian altitude and some bearings, but found the sun too hazy for p.m. sights. Crossed a bear track. Camped at 5.15.

☽ *May 31st.—Winds and Weather*—N., 5, o.m.

*Made good*—Course, S. ½ E. Distance, 11 miles.

*Distance traversed*—19 miles. Hours under weigh, 9.30.

Started at 7.40; got observations for time at 10; came in with the land at 11.30; saw two seals and two burgomasters; stopped at noon near the point; got the meridian altitude and a round of angles, together with some fuel. Camped at 6.

♂ *June 1st.—Winds and Weather*—o.m. S., 1, b.c.m.

*Made good*—Course, S.W. by S. Distance, 15 miles.

*Distance traversed*—19 miles. Hours under weigh, 9.45.

Thick close weather. Started at 7; saw a bear and several seals, and a burgomaster; 11.30 passed an ice crack one foot wide; 2.30 haze cleared off; got a round of angles. Camped at 5.30.

☿ *June 2nd.—Winds and Weather*—E., 1, o.

*Made good*—Course, S. by W. ½ W. Distance, 15 miles.

*Distance traversed*—19 miles. Hours under weigh, 10.

Started at 6.45. Two seals and several burgomasters seen. Hare and wolf's tracks numerous. Camped at 5·30.

♃ *June 3rd.—Winds and Weather*—E., 2, b.c. S., 4, b.c.

*Made good*—Course, S. by W. Distance, 11 miles.

*Distance traversed*—17 miles. Hours under weigh, 8.45.

At 6.45 started; 7.45 came in to the land; 8.45 got some fuel, saw ptarmigan, gulls, and recent deer tracks. At noon, opposite the 28th of August Pole; got meridian altitude, round of angles, and p.m. sights. Camped at 5.15.

♀ *June 4th.—Winds and Weather*—S., 7, o. q.q. s.

*Made good*—Course, S. ½ W. Distance, 8 miles.

*Distance traversed*—15 miles. Hours under weigh, 8.15.

Started at 7.30, having waited half an hour for it to clear; ice cracks more open, and water in most of them; several severe falls; suffering much from snow blindness, and unable to lead sleigh; camped at noon, too thick to see our way; at 4.30 moved again, and camped for the night at 8.15; got a little fuel; saw two flocks of duck; and after pitching the tent, Bear Island was seen.

♄ *June 5th.—Bear Island.*

*Winds and Weather*—S.S.W., 2, o.c.s.

*Made good*—Course, E.S.E. Distance, 14 miles.

*Distance traversed*—17 miles. Hours under weigh, 8.

Thick snowy weather cleared up a little at 7.30; moved at 8.30; saw two flocks of geese; reached Bear Island Depot at 11, and took 8 lbs. of biscuit. Camped on the ice 4 miles from Pemmican Point at 5.10. As we were raising the tent, something was seen to be moving on the shore opposite, and with the glass I soon made out it was our people. Going toward them I soon had the pleasure of meeting Lieutenant Jago. He had returned, it appeared, on the 30th, with all his party well, and Mr. Phayre becoming anxious after us, as all our bread was long ago expended, despatched him after us with provisions. He had got a good team of dogs from the natives, and being in the habit of travelling by night, was about to strike his tent when we hove in sight. I had satisfactory accounts from the ship, with the melancholy exception of the death of William Driver (ship's cook), which I

was almost prepared for. The natives had returned and had camped not far from the ship. Game had come in, but was not yet plentiful. Giving him directions to go a day's journey beyond Bear Island, and leaving his sleigh there to remain in the neighbourhood until the end of the week, so as to afford the *Resolution* assistance unless the ice began to move, in which case he was to return immediately, I also gave him a notice to deposit on Bear Island, fearing the ice in motion might prevent our revisiting it; and we supplied him with some bear's meat for his dogs.

⊙ *June 6th.—Arrive at ship.*

*Winds and Weather*—S., 2, o.s.

*Made good*—Course, E. ½ N. Distance, 13 miles.

*Distance traversed*—16 miles. Hours under weigh, 8.10.

The weather clearing a little after 7, we started at 7.40, and on coming to a formidable crack, took the dogs out, and managed to cross without damaging anything. We saw a Huski encampment under the cliffs of our first anchoring place, and at 4.30 I had the satisfaction of getting on board, being met by Mr. Phayre and nearly all hands one mile from the ship. With them were several natives, who at once recognised me as Kap-tin-na, and then overhauled our sleigh to see what we had brought back.

## SLEDGE JOURNAL, SOUTH.

### *Proceedings of the Victoria Sleigh under Lieut. Jago.*

*April.*—Left the ship on the morning of the 12th of April in company with Lieut. Phayre, crossed the inlet to the southward, and proceeded along the coast for Point Wollaston.

Parted company with Lieut. Phayre on the morning of the 14th, and arrived that evening where I had left the *cache*, one mile from the point.

On the 15th rounded the point, and on visiting the cairn erected there, found it had been disturbed, and the cylinder gone. As far as I could see from here the land trended S.S.E.

The 16th and 17th blowing and drifting so that it was impossible to travel.

*April 18th.*—Travelling along the coast over rough ice; and in the evening observed, from the low point we were encamped on, an island to the S.S.E., separated from the main by a narrow channel abreast of a high bold cape.

On the evening of the 20th we arrived at the island, and found it to be about 500 ft. high, and from 2 to 3 miles long in N.N.W. and S.S.E. direction; and on going to the top of it I found the land took a direction to the E.S.E., and having a good view I could see no bottom to the bay or inlet that was open to me, the opposite coast to the southward being about 30 miles off. From Point Wollaston the ice is thrown up inshore very much, in some places as high as 50 ft., and the thickness of the pieces as much as 4 ft. We left here a tin of meat and 10 lbs. of bread, and proceeded along the coast on the following morning. On going on the shore abreast of the island, I came across a pemmican tin, and marks of an encampment. This afternoon we were obliged to unload the sleigh to cross some hummocky ice, and make two loads of it; travelling very bad.

On the evening of the 22nd we encamped on the ice off a high cape, from which I observed a small island bearing about south 10 miles distant.

The 24th, 25th and 26th blowing so hard from the eastward that we could not travel, and it was not until the afternoon of the 27th that we were enabled to push on.

The 28th the travelling was very bad, ice much broken up. One of the men returning from collecting wood, told me that there was a passage inshore.

On the morning of the 29th I found that the whole of the land near us appeared to be islands, so I determined to travel along amongst them instead of taking the outside passage, as the travelling was so much better.

On the afternoon of the 30th of April I observed an island ahead with a cairn on it, and, to my astonishment, when we encamped, found that the *Investigator's* travelling party of last year had been here. The paper in the cylinder was

worded the same as the others we have picked up, so I left it with one of our printed papers. Having been now 19 days from the ship, and no land to be seen to the eastward, I determined to leave eight days' provision, including what I had left on the island to the westward, to carry us back to the *cache* on the other side of Point Wollaston. Land trending about E. by N.; opposite coast 12 to 14 miles off.

*May 1st*, 3 p.m.—Obliged to encamp; the weather thick and snowing.

*May 3rd.*—Blowing very hard from the E.N.E. and snowing; not able to travel.

*May 5th.*—Land trending about E.; opposite coast abreast about 25 miles.

*May 6th.*—Left 3 days' provisions.

*May 7th.*—Encamped on the land about 1½ miles up a bay.

*May 8th.*—Land low, and trending about E.S.E.

On the afternoon of the 9th I observed a party of Esquimaux encamped on the ice, and I went out to them, but found none of our old friends were there, and they having nothing to barter I left them; but they followed me to where I encamped. They behaved very well, and were very much taken with the vocabulary, offering anything they had in their possession for it. I purchased two dogs of them, also some reindeer's meat, and fish, and when I made signs to them that we were going to sleep, they perfectly understood me, and we parted very good friends. One of the dogs made his escape during the night.

*May 10th.*—Three of the men being perfectly blind, and two partly so, I determined not to travel that day, or go any farther to the eastward with the sleigh. So I started with two men to walk along the coast as far as we could, and there erect a cairn. On rounding a point I saw a large body of natives—45 men and 2 women—coming towards us, and knowing the state of most of the men I had left in the tent, I deemed it advisable to return, although much to my regret. On this point I erected a cairn, and placed a cylinder in it containing intelligence. The natives had no traces of having

communicated with any Europeans, with the exception of a few beads, which appeared to be the same kind as we got in Hongkong. They wanted us very much to come up to their encampment, which was about five miles to the eastward, but as they mustered upwards of one hundred in number, I thought we had better keep away. The men being much better in the evening, and my means placing me in that position that I could not have travelled, even if the natives had not been there, more than one day further, I came to the conclusion that I would return, and by that means make certain of reaching our depots before they had been disturbed by the natives. On going to the cairn I found they had already taken the cylinder, so I buried one.

The whole of the way coming back we had fine weather, but occasionally strong breezes from the eastward. We passed over one crack in the ice about 3 ft. broad on the 20th of May, and on the 22nd travelled along a crack that ran parallel with the coast from the mouth of the inlet to Point Wollaston; it then took off towards Bear Island, varying from 3 to 35 ft. in width.

Returned to the ship on the morning of the 30th of May.

I left intelligence at the following places: on an island bearing from Point Wollaston S.S.E. about 25 miles; the island where the *Investigator's* cairn was in lat. 70° 33′ N., and long. 114° 10′ W.; and at my furthest in lat. 70° 34′, and long. 110° 15′ W. The places that I have named beyond the *Investigator's* beacon, I hope you will let remain, and that what I have done will meet with your approbation.

I have the honour to be, Sir,

Your most obedient humble servant,

CHAS. T. JAGO, Lieut.

To RD. COLLINSON, C.B.,
Captain of H.M.S. *Enterprise*, &c., &c.

ON BOARD THE SHIP.

*June.*—I found the ship all a-taunto. All the block strops had been stripped, and the standing rigging thoroughly

overhauled. The carpenter had endeavoured to get at our broken rudder pintle by means of a canvas shute, but the pressure proved too great, and the canvas burst. Our mizen topmast staysail being worn out, I thought a mizen topsail would prove a more efficient sail. One of the spare topsail yards was converted into a crossjack yard, without interfering with its original purpose, and the armourer under the carpenter's direction fitted a very good iron truss.

On the 12th of June the pinnace was brought alongside over the ice from the shore.

Mr. Jago returned at 3.30 a.m. on the 13th, without any intelligence of the missing *Resolution*, and I now began to be seriously alarmed about them, fearing the cracks in the ice might expose them to starvation.

Corporal punishment was inflicted on the 14th on the two men belonging to my party who had got drunk on the Princess Royal Islands.

The water had begun to run from the snowdrifts on shore; but finding what oozed from the one abreast of us was impregnated by the turf, we commenced to fill some of our tanks with ice. The small fragments at the lake were collected, and bread bags being the most convenient things to put them in, they were used for that purpose. The ice about our tide-pole giving way, and becoming so rotten as to render the approach to it dangerous, the pole was removed to a firmer spot on the 16th.

Mr. Jago was again sent out to form a depot of provisions midway on the north shore between Pemmican Point and the ship, so that in the event of the *Resolution's* people having to take to the land, they would find some sustenance. As the warmth of the weather increased, we found the stream of water abreast the ship to be pure, and completed from that source. Lieuts. Phayre and Jago took it in turn, week about, to go out shooting, camping either in south bay or the outer part of our own bay. Two men were also tented out to the eastward, and what with those thus obtained, and what were killed in the vicinity of the ship by the surgeon and his assistant, we began now to have two fresh meals a

week. The deer were numerous, but too wary to admit approach. The natives remained about us, but did not appear to get much.

On the 29th June, shortly after I had wound up the chronometers, I heard something like a cheer, and jumping on deck had the satisfaction to see the lost *Resolution* coming round the point. I had made up my mind that we should have to go to the Princess Royal Islands for them, or that they would not make their appearance until the ice was sufficiently open to permit the use of the *Investigator's* whale boat. The ship's company in a very proper manner had come aft the week previous volunteering to go after them; but as Lieut. Jago had seen cracks in the ice upwards of 30 ft. wide a month previous, I could not listen to their request. The congratulations were very hearty and very sincere. I found that three days after leaving me, he had come amongst ice in which the sleigh could not be dragged, and that leaving it he had set out with all his party, and succeeded in reaching Melville Island. One of his men was so severely frostbitten as to be on the sleigh, and another suffering from the same cause—but I will leave him to tell his own tale.

Prevailing winds during the month of June:—

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6¼ | ¾ | 1½ | 1¾ | 2¼ | 2½ | 1 | 2¾ | 5¾ | 5½ | = 30 days. |

## SLEIGH JOURNAL—MELVILLE ISLAND.

*Journal of Proceedings kept by M. T. Parkes, Acting Lieutenant H.M.S. Enterprise, in charge of Sleigh Resolution.*

*April 16th*, 1852.—7 a.m. left the ship in charge of Sleigh *Resolution*, and 7 men, in company with the captain, and proceeded up the Prince of Wales Strait. On the evening of the 28th we arrived at the Princess Royal Islands, where we filled up with provisions for 32 days, and left again the following morning.

*May 5th.*—Parted company with the Captain at 6 a.m. with

orders to proceed towards Melville Island, and endeavour to reach Winter Harbour, to search for traces of the Missing or Eastern Expedition, and to meet him again at this place on the 22nd inst. We were victualled for 18 days, leaving the remainder behind in lat. about 73° 6′ N. At 6.15 a.m. started with strong breezes from the S.W., and squally. Lat. at noon 73° 12′, travelling smooth. 5 p.m. pitched our tent; we have gone to-day about N.E. 15 miles.

*May 6th.*—Started at 7 a.m. with a light breeze from the S.W., and fine weather; middling travelling. 5 p.m. pitched the tent; gone to-day about N.E. 15 miles.

*May 7th.*—Started at 7 a.m. with a fresh breeze from the S.W., and fine weather, but hazy. Lat. at noon 73° 26′. Pitched the tent at 5 p.m., clear of the strait; smooth travelling, but snow too deep to make it good. We have done about 13 miles, N.E.

*May 8th.*—Weather very unsettled and thick, so that we could not start. Overhauled the sleigh, found a great number of screws of the runner bands loose, and part of one of the bands gone. Relashed the stretchers. 9 a.m. the weather cleared a little; started, and kept on till 1 p.m., when getting among the hummocks, so that we could not move the sleigh, and the weather becoming thick, we pitched the tent. In the evening the weather cleared; went to the top of a high hummock, from which I saw the high land of Banks Land seen by Capt. Parry, and as far as the eye could reach nothing but a sea of hummocks, of old and new ice mixed up together, and not the slightest signs of moving a sleigh through it.

*May 9th.*—Fine weather and clear. Employed in the forenoon in looking for a passage for the sleigh, but did not succeed; then determined on leaving the sleigh behind, taking our provisions on our backs, with blanket bags, and raccoon skin to sleep in. At 6 p.m. we started, taking 8 pieces of pork, 16 lbs. of preserved meat, a tin of pemmican, 20 lbs. of potatoes, 35 lbs. of bread, tea, sugar, &c., 2½ galls of rum, for cooking. Lat. of tent 73° 31′, road so bad that a man could scarcely get a footstep.

*May* 10*th.*—At 4.30 a.m. stopped behind a hummock to sleep; found it would not do to burn spirits to cook our meat and potatoes, so we only used it to make tea. As the raccoon skin would only hold four of us, we were obliged to sleep watch and watch. 5.30 p.m. started again with fine clear weather.

*May* 11*th.*—Our road getting much better; travelling over large fields of old ice, with very large hummocks from 30 to 40 ft. high. 5.30 a.m. stopped to sleep; fine weather, with a breeze from the N.W. 5.30 p.m. started again, but obliged to bring up at midnight, as Bryan was complaining of weakness in his legs, and could not walk. I had taken his load from him some time before, dividing it between Rich and myself. We were out of sight of land, and getting into a road that a sleigh would go over, although anything but good, and passing enormous hummocks of ice.

*May* 12*th.*—Strong breeze from the N.W., with heavy drift. Started at 8 a.m., but obliged to bring up at 1 p.m., for Bryan, who said that he could not go any further. Dug a hole in a snow drift for him, and gave him the raccoon skin and blankets, and made him some hot grog. Strong breeze from N.W., with heavy drift. 8 p.m. I told Bryan I would stop for him no more, and he must come on, as the people were getting tired, they being obliged to walk about all the while to keep themselves warm. 10 p.m. sighted Melville Island. Since leaving the tent I have been steering about N.E. by N. Midnight, wind went down.

*May* 13*th.*—3 a.m. all hands being very tired, and five being blind, stopped to sleep under a hummock in lat. 73° 54′; fine weather, with a breeze from the west. 4.30 p.m. started again, road very good for walking, but not for a sleigh. Midnight, fair weather, and calm. Bryan better.

*May* 14*th.*—Obliged to take Smith's load from him; divided it between Cooper and myself. 5 a.m. stopped under a hummock to rest in lat. 74° 06′; fine weather, and calm. 4.30 p.m. started, four of the people being blind; travelling very good, but making slow work of it. All our rum burnt out; left the breaker with what gear we did not want on top

of a high hummock about 50 ft. Bryan all right; gave him the raccoon skin to carry.

*May 15th.*—Fine weather, and calm. 5 a.m. stopped to rest under a hummock, as we were coming on the inshore hummocky ice, where the old and new ice met. Cooper almost lame, having knocked a nail off his big toe, and then got it frostbit. Fine weather, and warm. 4.30 p.m. started, making poor work of it among the small hummocky ice. 11 p.m. came on the smooth inshore ice; from here I got a good view of the south shore of Melville Island.

*May 16th.*—12.30 landed on Melville Island under Cape Providence; fine weather, and calm; four of the people being partly blind, and one almost lame, and all hands fagged, I saw it was impossible to get them on any farther, so I left five of them at Cape Providence, taking Rich and French on with me to Winter Harbour. But immediately after leaving the people, and getting on the ice, I saw sleigh tracks, and marks of three men's footsteps going towards Point Hearne, but they were too much defaced to make out whether they were European or Esquimaux. I then told the people to move up the coast to a place I pointed out, after they had slept. I had given them the raccoon skin, and the only gun I had with me. After going a short distance I saw other sleigh tracks, but older than the first, and going in a contrary direction. 7.30 went on shore to sleep; lat. 74° 53′. 12.30 p.m. started again on our road, when I again saw sleigh tracks: road very good for walking. 6 p.m. fine weather, with a breeze from the S.W., being within 4 miles of Point Hearne, having large hummocks of ice between us and the shore. Heard the howling of Esquimaux dogs, as if being put into harness. Having no arms, and being so far from the people, I was not in a fit condition to have any communication with the natives. Although very loth to do so, I was obliged to turn back. 11 p.m. came up to the point where I had told the people to move to, and found they had just arrived, and that they had managed to thaw some water in a pemmican tin, but had shot nothing. Had they

done so I would have taken them on to Winter Harbour, but having only half a tin of pemmican left, the only thing I could do was to erect a pile of stones on the point, and leave the captain's cylinder, which I did, scratching the ship's name on a large stone on which the pile was built. I also filled up one of the bottle or tide papers, merely saying who the cylinder was left by, and that I had endeavoured to reach Winter Harbour, but had failed. I judge the lat. of the pile to be 74° 32′, from which I could see Point Hearne distinctly.*

*May* 17*th.*—5 a.m. started on our road back; light wind from the S.W., and hazy. 11 a.m. stopped under Cape Providence to sleep. 5 p.m. thick weather, with a light breeze from the S.W.; left Melville Island, finding our way by our old tracks; midnight, snow.

*May* 18*th.*—Calm and overcast, very mild considering how cold we have had it. 4.30 stopped to sleep under a hummock, when shortly after it came on to blow very hard from the N.W., with heavy drift. 4 p.m. started again, and at midnight the wind went down.

*May* 19*th.*—Picked up our rum breaker, with the rest of the gear we had left on a hummock. Fine weather, with a light breeze from the N.E.; at 6 p.m. stopped to rest. Bryan found he had half his foot frostbitten, one of Rich's toes the same, and Cooper's foot very painful, and getting much worse. 4 p.m. started with a fresh breeze from the N.E., and cloudy; lost our old tracks; midnight, out of sight of land.

*May* 20*th.*—Fine weather, with a light breeze from the N.E.; at 6 a.m. stopped to sleep under a hummock; noon, blowing hard from the N.W., with drift. 3.30 p.m. started, saw the land; midnight, ate our last piece of pemmican.

*May* 21*st.*—Fine weather, with light variable winds; fired at a bear, but missed him. 11 a.m. reached the tent, all the

* These tracks and the dogs belonged to the sledge party of Captain M'Clure from the *Investigator*, then in Bay of Mercy. Another instance of the unfortunate mischances of Arctic travelling.—[Ed.]

people very weak and tired; found Wilson had both his feet bruised and frost-bit.

*May 22nd.*—Light variable winds, and fine weather; the people too much fatigued to start with the sledge; Bryan's foot getting worse, but the rest much better. In overhauling the sledge we found that the foxes had ate all our hide seizings of the stretchers.

*May 23rd.*—Light breeze from the southward. Started at 6 p.m. and made for the land to get fuel, and try to shoot something, having only 8 lbs. of meat and some cocoa left.

*May 24th.*—People very weak; Bryan complaining about his foot. 1 a.m. pitched the tent,* ate half our meat, and thawed some water. 5 p.m. fine weather, with a light wind from the S.W.; started again.

*May 25th.*—Fine weather; 4 a.m. got under the land, pitched the tent, shot three ptarmigan, and found wood. Made soup of our last tin of meat and the birds, and cooked some cocoa. 8 a.m. started with Bryan on the sleigh. 1 p.m. stopped again, and pitched the tent; light wind from the N.E., and fine weather.

*May 26th.*—Light airs, and cloudy. 4 a.m. started; I went on the land to try and shoot something, but getting astern of the sledge I was obliged to return, as I was very weak. 3 p.m. pitched the tent; people very weak for want of food; judging my distance from the depot to be about 12 miles, at 10 p.m. I sent Rich with two hands to get some provisions;† midnight, thick weather, with a light breeze from the southward.

*May 27th.*—Light winds from the southward, and thick weather; in the tent all day. 10 p.m. Rich and party returned with provisions from the depot, also bringing a cylinder left by the captain, saying he had gone on to the island, dated 26th; shot a hare, and eight ptarmigan.

*May 28th.*—Thick weather, with a breeze from the N.E., and drift; in the evening it cleared. 11 p.m. got under weigh!

* I was within three leagues of the tent this day.—R. C.

† He reached it just 24 hours after I had left it.—R. C.

*May* 29*th.*—Thick weather, with a light air from the southward. 5.30 a.m. pitched the tent; snowing at intervals during the day. 8 p.m. started; midnight, very thick weather, with snow.

*May* 30*th.*—Weather very thick, with snow; getting among hummocks, and seeing nothing; pitched the tent; weather very thick during the day, but clear at times; Bryan walking by the side of the sledge.

*May* 31*st.*—5 a.m. fine weather, and calm; started, and at 4 p.m. stopped at the depot; besides our own provisions we found the Captain had left some bear's meat; midnight, fine weather, and calm.

*June* 1*st.*—6.30 a.m., fine weather and calm. Started, and at 10 a.m. we stopped to get wood; 6 p.m. started again; fine weather and calm.

*June* 2*nd.*—Fine weather; pitched the tent on the land at 3.30 a.m.; 4 p.m. started; picked up the meat at the point that had been left by the Captain and myself on our way up.

*June* 3*rd.*—2 a.m., Bryan unable to walk; pitched the tent; 6 p.m. started with Bryan on the sledge, road very bad; fine weather, with a light breeze from the N.E.

*June* 4*th.*—3.30 a.m. pitched the tent; 6 p.m. started; thick weather, with snow; finding our road by the Captain's track; midnight, lost sight of the Captain's track; obliged to camp.

*June* 5*th.*—Weather cleared; got sight of the Princess Royal Islands; 6 a.m. started, but coming on very thick again with snow, pitched the tent at 8 p.m., weather cleared; saw the island about 10 miles off; sent Rich with a party for provisions.

*June* 6*th.*—Blowing hard from the N.E. with drift; noon, wind went down; 6 p.m. Rich and party returned, bringing provisions, and a cylinder left by the Captain.

*June* 7*th.*—Fine weather, with a light wind from the N.E.; at 8 p.m. started, making right down the strait between the islands and the shore.

*June* 8*th.*—Fine weather, with the wind from the N.E. 3 p.m. pitched the tent between the islands and the main.

In the evening it came on to blow hard from the N.E., with drift.

*June 9th.*—In the morning blowing hard, with drift; towards the evening the wind went down; 6 p.m. started with the sledge to the island for provisions, leaving Bryan and Cooper with the tent, Cooper being very sick.

*June 10th.*—Fine weather. Noon, returned to the tent with provisions. Midnight, fine weather, with a light wind from the N.E. Poulticed Wilson's foot.

*June 11th.*—Fine weather and calm; 6 a.m. started; 11.30 pitched the tent; 8 p.m. fine weather; started again.

*June 12th.*—Fine weather; 4.30 a.m. camped under the land; 8 p.m. started. Since having our provisions all hands have been loose in the inside, and felt very sick.

*June 13th.*—Fine weather, with a light wind from the northward; 4.30 a.m. pitched the tent on the land; picked up wood; 8 p.m. started; hazy weather, with a light wind from the S.W. All hands bad in their inside. Wilson lame.

*June 14th.*—Thick weather; 5 a.m. camped on the land; 6 p.m. blowing hard from S.W., with heavy drift.

*June 15th.*—Blowing hard from S.W., with heavy drift; wind went down towards the middle of the day; in the evening thick weather with sleet; all hands bad in their inside. Shot two geese.

*June 16th.*—Thick weather with sleet; towards noon it cleared a little; 5 p.m. light sleet; got under weigh.

*June 17th.*—Thick weather with sleet; 3 a.m. camped on the land; towards the middle of the day it cleared up; 7 p.m. fine weather; struck the tent; shot three ptarmigan and two geese.

*June 18th.*—Fine weather; light variable winds; camped on the land at 3.30 a.m.; travelling good; 6.30 p.m. started; light winds from the westward, and cloudy.

*June 19th.*—Hazy weather and warm; camped at 4 a.m; travelling good; started again at 6.30 p.m.; fine clear weather, with a light air from the westward. Midnight, unloaded the sledge to cross a crack. Wilson's foot getting better.

*June* 20*th.*—Fine weather and calm; 3.30 a.m. camped; very warm in the middle of the day, and fog. At 6 p.m. started; calm and fine; midnight, very thick.

*June* 21*st.*—Good travelling; very thick weather, and getting among hummocks; camped at 1.30 a.m.; noon, blowing hard from the south, with heavy rain. Midnight, wind going down, and weather clearing.

*June* 22*nd.*—Fresh breeze from the W.S.W. At 5 a.m. started and made for the land, all our gear being wet from last night's rain; pools on the ice 6 inches deep, and in some places more; at noon got on the land; spread all our gear to dry. Light winds from the N.W. and cloudy.

*June* 23*rd.*—First part of the morning it was thick, but towards the middle of the day it cleared up. Lat. 72° ·04 N. Shot a goose; 5 p.m. started; fine weather and calm; walking through water almost knee-deep, five of the party having nothing to wear to keep the water out. Cooper's foot very bad.

*June* 24*th.*—Light breeze from the southward, and cloudy; 1 a.m. camped on the land; 5 p.m. fine weather; started; shot a duck. Bryan complaining of pains all over him.

*June* 25*th.*—Fresh breeze from the southward, and cloudy; 2 a.m. camped on the land; travelling in some places good, in others bad; a great quantity of deep snow with water underneath; noon, blowing hard from the southward, with rain; 5.30 p.m. started; strong breezes from the northward, and cloudy; 6, passed the Captain's beacon; shot a goose and a duck.

*June* 26*th.*—Passing showers of sleet; water on the ice, just clear of the bottom of the sledge; 2 a.m. camped; noon, fine weather, with a fresh breeze from the westward; some of the people complaining of pains in the chest; 5.30 p.m. started; very variable weather; 9 p.m. picked up provisions left by Mr. Jago. Midnight, strong breeze from the north and cloudy.

*June* 27*th.*—Travelling good; came through very little water; shot three geese and a duck; 2.30 camped on the

land about 6 miles from Bear Island Point. Fine weather, with a breeze from the westward; 5 p.m. started; picked up the bread, potatoes, and meat, off Bear Island Point, left by the Captain. People walking up to their knees in water; shot a goose.

*June 28th.*—Fresh breeze from the southward and cloudy; 3.30 a.m. camped on Pemmican Point. Noon, strong breeze from the S.W. with fog; 8 p.m. started for the ship; picked up provisions left by Lieutenant Jago; thick fog, with a light wind from the S.W.

*June 29th.*—Shot two ducks; thick fog; 9 a.m. arrived on board the ship.

*End of Lieut. Parkes' Sledge Journal to Melville Island.*

## ON BOARD THE SHIP.

After so long an absence, and undergoing great privation, for it may be said that they were without fuel seven days, and on three different occasions with little or nothing to eat, I was surprised to see the greater portion of them looking so well. And by all accounts the greatest suffering was endured between the Princess Royal Islands and the ship, when they had abundance, except bread.

Bryan was immediately put into a cot, and the surgeon reported that at present he was in too weak a state to undergo any operation, but that eventually he would most likely lose the greater portion if not the whole of one foot. Cooper also was severely frost-bitten, and it was yet difficult to say how far the knife would have to be applied. The others, however, were likely to be short cases. Joe (the dog) had accompanied them faithfully all the way, undergoing at one period a narrow escape of being put into the pot. But yesterday, while they were camped on Pemmican Point, he went off. My belief is that he recognised the place, and on his way to the ship was kidnapped by the natives, and not being of a pure huski breed, would most likely be prized by them.

The return of the party relieved my mind from an incubus, and it was for some period, when I woke in the morning, that the impression they were still absent did not occur, and that I had to convince myself their return was not a dream. Under a deep sense of gratitude, I returned public thanks next Sunday to Almighty God, that it had pleased Him to permit our travelling parties to return in safety, and to beseech Him to give us that sense of His mercies, to praise and glorify His Holy Name.

## SECTION XI.

### DOLPHIN AND UNION STRAITS.

### SUMMER, 1852.

*July.*—The natives had got some deer and a quantity of geese, some of which they could now afford to part with, and was bought accordingly. The latter had been caught while moulting. Finding also that they were in the habit of catching fish through holes in the ice, a party was established for that purpose on the lakes. They had not, however, much success, the fish not biting readily, and our people not having patience with the spear. The flagstaff was brought on board and the sails bent; but it was not until the 16th of July that the ship moved in her icy cradle, and eventually tended to the wind on the 19th.

The communication with the shore now became difficult, there being a lane of coast water into which the dingy was put, and cruised about principally under the charge of Mr. Atkinson, picking up ducks and driftwood. The former, as will be seen by our game return, were very plentiful, and their skins much sought after by the natives.

On the 18th we were obliged to take up our tide-pole, the ice becoming too rotten to permit its being visited. We began also to make use of our whale boats to land and embark the fishing and shooting parties.

On the 21st Mr. Phayre sent word in from Isthmus Lake that the ice on it had nearly all disappeared, and the fish were rising in numbers; that if he had the seine with Halkett's boats he might be able to do something. Lieut. Jago accordingly took them across the following morning, and the experiment succeeded admirably. The two india-

rubber boats, the smaller taking the large one with three men, and a 45-fathoms seine in tow, laid it out very well; and from this period one watch went to the lakes every day. A good fish dinner was there served to them, and the remainder brought on board, and issued in lieu of the usual allowance at the rate of 3 lbs. for 1. Sorrel also began to make its appearance in abundance, and parties were sent to collect it. Musquitoes began to be troublesome. The surgeon, assisted by Mr. Adams, having prepared a collection of birds, now began to turn his attention to the flora, and I was quite surprised at the number and variety he collected. Several butterflies, spiders, and other insects were obtained. We attempted to get at our lower rudder pintle by diving, but the cold would not admit of our remaining long enough under water to succeed. So the rudder was shipped on the 29th.

The ice remained close outside, but inside the bay was entirely broken up. A piece of driftwood left on it nearly in the centre of the bay, 1½ mile from the ship, was brought under the bows. At times we had clear water to the opposite shore, and in the course of three or four hours the bay would again be full, rendering it necessary to launch the boats from pool to pool. Several showers of rain gave us hopes that the period of our liberation was not far distant. In fact, things looked so promising for a move, that I sent the topgallant yards up on the 1st August.

Prevailing winds during the month of July:—

| Calm | Vble. | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | (true) |
|---|---|---|---|---|---|---|---|---|---|---|
| 9½ | ¼ | 3¼ | 3½ | 1 | 1¼ | ¼ | ¼ | 6½ | 5¼ | = 31 days. |

The carpenter having made an outline sketch of a human skeleton, it was placed on the grave of our deceased shipmate, in hopes that it would deter the natives from disturbing his remains. They paid us a last visit on the 3rd, and we parted very good friends. We would have been better pleased could they have abstained from stealing. There is, however, great excuse for them; such riches they had never seen before: pieces of iron hoop, empty preserved meat tins, old clothes, &c., were still eagerly sought for. In considera-

tion of the many bows and arrows that had been purchased from them, I presented them as a last gift with one of the small spars we had obtained at Sitka, which would nearly supply the whole tribe. It is very difficult to say where they wintered, but I do not think they went further than the inlet Mr. Jago explored. Leaving us as they did on the 9th of November, and the sun disappearing on the 18th, there was but little daylight left. That they went round Point Wollaston is, I think, almost proved to a certainty by the cylinder deposited by Mr. Skead having been removed; and that they had been in communication with the party met by Lieut. Jago is also, I conceive, evident by the fact of his seeing Hongkong beads in their possession. My belief is that they wintered on the islands to the north side of that inlet he explored, where tide and wind would occasion cracks throughout nearly the whole winter, and whence they obtain seals. Several skins full of blubber were on their sleighs when they first returned, of which Mr. Phayre purchased five, making us rather more than 60 gallons of oil. Fuel they are totally independent of, and a snow-drift affords them material for a winter habitation, the most elaborate of which would not occupy the family more than a day in erection. While with us they were constantly on the move, the tent seldom remaining two days in the same position, unless for lake fishing. In one particular, that of having no means of going upon the water, they differed I believe from all the Esquimaux that have yet been met with. They were, however, perfectly acquainted with the name and use of the *kayak*, distinguishing it from the *oomiak* by the double paddle. The one I had I never received a request for, while the huski sleigh we had obtained from Capt. Moore was eagerly coveted. Our party certainly did not exceed 50; Mr. Jago met with 100; and these were the northernmost portion of the tribe, as beyond the parallel of 72° 10′ N. in the Prince of Wales Straits, we met with no recent traces of them on Prince Albert's Land.

## Description of Walker Bay.

On going to the top of Flagstaff Hill on the morning of the 5th of August I thought the ice sufficiently open. So embarking our dogs, and stopping the fishing party, we got under weigh, glad to go, but really regarding with some affection a spot which had proved very comfortable winter quarters for us. I must now describe it and the adjacent locality, to which, however, I am only entitled to affix temporary names, as the honour of the discovery belongs to Capt. McClure.

Beginning on the north with Bear Island. It is low (120 feet), 2 miles from north to south, and 1 from east to west, lying not quite 3 miles from the main. Mr. Parkes got one line of soundings between the two, carrying from 7 to 4 fathoms; but no vessel ought to run through the channel without further examination, as we found the soundings in the ship very irregular to the southward of the island. It is in lat. 71° 35′ 2″ and long. 119° 6′. When in its neighbourhood, both sides of the Prince of Wales Straits can be seen, if the weather be at all clear. Prince Albert's Land opposite trends to the northward, and to the eastward, the Point not being above 40 feet above the sea. Nor do the hills rise until 4 leagues to the north of it. Our winter quarters lay nearly due east from the island 27 miles. From Bear Island Point (off the S.E. end of which there is a patch of black rocks) to Pemmican Point the distance is 8 miles; the intervening coast receding to the northward, forming a bight exposed to the southward and westward. The latter is a low peninsula, jutting out 2 miles to the west of a bold bluff (Parkes Bluff), which is a conspicuous landmark, the hills behind it rising in three table ridges; and further inland is a cluster of five small cones, on the summit of what is the highest land we have yet met with in this country (probably 1500 feet). The bluff, the table-land, and these peaks form a guide to the bay before Bear Island will be seen. The width of the bay opposite Parkes Bluff is 6 miles; the southern shore

(Cape McClure) terminates south-westerly in a table bluff, off which I am inclined to think a shoal runs. On its N.W. face is a remarkable dome hill (Mount Phayre), and on the same shore, 8 miles to the E.N.E., is Crag Point, which has all the appearance of an old castle or artificial mound.

Three miles beyond Parkes Bluff is Point Anderson, a low cliff, terminating in a shingle point: the coast-line on the north shore then takes a turn to the northward and eastward, forming Jago Bay, and which is called by the natives *Ta-ku-nin-ga*. It appeared to us that the ice opened here earlier than in our winter quarters, and that the ship could have gone to sea four days before she did from Winter Cove. Due east, 4 miles from Point Anderson, forming the southern side of Jago Bay, is a very remarkable headland, Skead Bluff, under the east end of which the ship first anchored. Skead Bluff lays N.N.E., 3 miles from Crag Point, the latter being shoal to. East, a little southerly, from Skead Bluff, is Point Atkinson, which is also shoal to. Point Arbuthnot lies to the south of it 1½ mile, forming the entrance to Winter Cove, on the north shore of which we wintered, and which the natives call *Ka-ma-hi-nik*. Off Point Arbuthnot is an islet, separated from the main by a boat channel; and to the southward of it is a well-sheltered spot: the entrance to it will however require examination, as the edge of the shoal-water extending easterly from Crag Point has not been defined. On the north side, between Point Atkinson and our anchorage, is a small cove, in which there is as much as 4 fathoms; but I thought it too confined for the ship. Our flagstaff was erected on the hills immediately north of the ship, and its position will be known by the pile of stones, and also the grave of William Driver. It is in lat. 71° 36′ 4″ and long. 117° 41′ W. The variation was 81° 21′ E., and the dip 86° 39′ N. at the water-side in June, 1852.

From the Flagstaff Hill, on very clear days during the winter, I have seen Bear Island, Bear Island Point, Pemmican Point, Parkes Bluff, and Skead Bluff, all of which

show outside one of the other; but on the southern side Crag Point prevents Cape McClure being seen.

Opposite our anchorage on the south shore is Dome Hill; the road to South Bay lay to the eastward of it, and about its base were the lakes whence we obtained our fish.

South Bay (Minto Inlet), the entrance to which is formed between Cape McClure (Cape Richards) on the north, and Point Wollaston to the southward, is 23 miles wide at the entrance, and runs back 55 miles to the eastward. Point Wollaston terminates in a low shingle point, the cliffs rising about half a mile inland, and so rounded off, that when abreast it is difficult to distinguish. I believe the native name for it to be *Ka-nal-go-ak*. Its position is 72° 3′ N. and 118° 20′ W.

On the north shore, 10 miles inside Cape McClure, is Fish Bay, where we lay from the 8th to the 14th of August: it is exposed to the south and westward, and the ice came in upon us three times. One mile to the east is a small islet, and one mile further the opening to the inlet which we communicated with from our winter quarters. It is 7 miles deep, and is beyond a doubt the best wintering spot in this vicinity. I should recommend the N.W. corner, both for the convenience of shooting and fishing. At the mouth it is 2 miles wide; the southern point is a black precipitous cliff, with an islet off it. In the upper part of the bay are several islets, and some rocks. A ship will do well to feel her way by her boats, as we obtained few or no soundings in it. To the east of Black Cliff 4 miles are two islets; and 13 miles further the bay separates into two arms, the point of separation being a high cliff, with an elevated range of hills behind it, and an islet below. The north inlet terminates in a large lagoon. The bottom of the southern one was not seen; there are however two islets in it. The entrance to it lays 38 miles from Point Wollaston, a portion of the intervening coast-line being cliffs. Information respecting the depôts of provisions and our movements was deposited in nine remarkable spots about these bays.

The geological feature about our winter quarters is for the

main part blue limestone, which the action of the frost in many instances, and particularly about the summit of the hills, had split into large flagstones, but we could discover no organic remains. On the summit of the table-land north of us traces of volcanic action appeared. In South Bay, sandstone began to mix freely with the limestone, the latter assuming a yellow tinge. On the beach in Fish Bay was a block of lava, with broad veins of quartz in it.

### Proceed to Sea.

*August 5th.*—Having sent a boat to see whether there was water enough for the ship between the ice and shoal off Point Atkinson, we got under weigh at 9.30. We had, however, light and baffling winds, which prevented our getting further than Skead Bluff by 4 p.m.; within a cable's length of which we were compelled to anchor, the channel not being wide enough to work through. Getting a start from the northward, we weighed again at 5, and running through a crack, got into a large pool; but it was 8 a.m. on the 6th before we reached the open water, and then had the mortification to find that there was a large body of ice to the seaward of us. We, however, rounded Cape McClure, and stood to the southward towards Port Wollaston, in hopes of keeping in the land-water. Being well in with the land to the east, about 6 miles off the point, I sent Mr. Phayre on shore, with the double purpose of seeing whether there was open water to the southward and to collect firewood. The boats returned at noon with a load each, but with a very unfavourable report as far as regarded our progress, the ice being closely packed on the point, not even leaving a boat channel. We employed the remainder of the day in collecting fuel, and in the evening I ran over to the north shore, wishing to avoid the ice that was coming down from the head of the bay. We got over by 9 p.m., and being off a cove which promised to afford shelter, by dint of towing we anchored in it, at 1 a.m., August 8th.

Remaining quiet on Sunday, except a walk on the hills to

examine our locality, and look at the ice outside: I found we were in a very advantageous situation, commanding a good sea view, having a large lake within a mile of us, and a convenient watering place. On Monday morning I went to the eastward, so as to bring up our triangulation, and found we were only 2 miles from the entrance to the inlet with which we had communicated overland. Mr. Parkes was sent to the westward, to sound off the points, in the event of the ice compelling us to give them a close shave, and to pick up what drift-wood he could. The third whaler and dingy were employed in the bay, scouring its shores for fuel; and Mr. Jago carried the seine and Halkett's boats across the land to the lake, which was found to be 6 miles in circumference, extending to the N.W. corner of the inlet; from which it was separated by a narrow isthmus. During the forenoon the ice came into the bay, and brought a heavy strain upon the cable, until it took the shore, when the pressure was relieved; but we all experienced considerable difficulty in getting back to the ship; the ice being in that condition that you could not walk on it, and only force the boat through with time and labour. The fishing party having been successful, the other watch was sent the following day, August 10th; the ice showing no signs of opening to seaward, but coming in and going out of our bay with the wind; sometimes so completely filling it, that our dogs got off to the ship on it. Finding the ship too light and by the stern, we took off 4 tons of stone ballast. A cairn also was built on the headland on the west side of the bay, and information deposited.

*August 12th.*—The day being calm, Mr. Parkes had capital success with the seine, bringing on board 560 lbs. of fish, some of which weighed 30 lbs., and proved excellent.

We did not get out until 10.30 p.m. on the 14th, when we again stood towards Point Wollaston; but finding there was no land water off it, we commenced tracing the pack edge westerly; the sea, however, appeared to be full of ice, affording a strange contrast with what we had witnessed a fortnight later last season. After trying one horseshoe after

another, and finding our progress blocked, we were actually set fast, on the morning of the 18th, by young ice. At 3.45 p.m. the current set S.S.W. true 0·4 per hour.

*August 19th.*—The ice opened a little, and we got into land-water 2 miles to the south of the point; but our progress being again barred, the boats were despatched for fuel, and erected a mark on a conical mound, 5 miles to the S.S.E. of Point Wollaston, from whence Mr. Arbuthnot got a good, but very discouraging, view of the ice. On going on shore Mr. Phayre passed over a ledge, not however getting less than 3 fathoms, the water inside deepening to 5. The country appeared to be much more bleak and barren than our winter quarters.

The ice remaining much the same, the boats made another trip on the morning of the 20th of August. It opened a little in the afternoon, and we made 10 miles to the southward; but the wind falling calm we were set fast in the morning, and made no progress at all on the 21st. The young ice being half an inch thick at midnight, the carpenters were set to work to build a sanpan, that is to say something half box, half sleigh, and whole boat, which was to aid us in the lake fishing, and act as a punt when required.

During the 22nd it was evident that the current was carrying us back again to the northward, and brought us to Point Wollaston by noon on the 23rd of August. I then determined on seeking the open water to the northward and keeping in it, as it was evident our object could not be gained by entering the pack.

By dint of warping, and a little blasting with gunpowder, we succeeded at 9.30 p.m. on the 24th of August; and then followed the edge of the ice to the westward, looking up into the heads of all bights, until we satisfied ourselves that there was no progress southerly. This eventually took us over to Baring Land; and at 9 p.m., being about 2 miles from the shore, and 12 to the east of Cape Erebus (Nelson Head), I sent Mr. Arbuthnot in shore to deposit information, and to see whether the ice closed the land to the westward. He returned at 1 a.m., 26th, reporting the ice to be close

in with the shore, and that he had discovered a snug harbour which appeared to have sufficient depth of water for the ship. We then made our way to the eastward again, but were compelled, in consequence of the northerly drift of the ice, to enter the Prince of Wales Straits; and at 7 p.m., 27th of August, after trying all in our power to get to the southward, we found ourselves off Bear Island, and our bay with more ice in it than when we had left it 22 days previous. I began to despair of our having any summer at all, and my scheme of crossing over first to the American continent, and taking in a load of firewood at Cape Parry, had to be abandoned; and we could only look forward to entering the Archipelago formed by Wollaston, Prince Albert and Victoria Land, by means of the strait explored by Lieut. Jago (Prince Albert Sound).

I sent Mr. Phayre to deposit information on the island, and after he had left two deer were seen, and another boat despatched in hopes of cutting them off, in which however we were unsuccessful.

Towards morning, there being no signs of the ice opening to the south, we again rounded the north end of the pack; and then, getting a northerly wind, the ice opened sufficiently to permit our going to the southward, and we reached the centre of South Bay by noon; but the wind then failing, and at 6 p.m. coming in from the southward and westward, we made fast to a floe.

On the morning of the 30th of August it drew round to the eastward, and the ice beginning to move we cast off, trusting at last to bid adieu to the neighbourhood of our winter quarters. Bight after bight was examined without success; but still the ice was more open, and we were again to the southward of Point Wollaston.

We did get into a lane of more open water than we had yet seen on the afternoon of the 1st of September, but getting embayed at the head of it, were driven again to the north, within 5 miles of the point, and 2 of the shore. Mr. Phayre went for another load of wood, and the young ice to-night was 1 inch thick.

There was, however, now some land-water, which opened every day more and more to the southward; and at noon of the 5th of September we had got so far to the south as to make out the island at the entrance of the straits, but there was still a great body of ice about it. It was now beginning to get so dark that we were compelled to heave to for four hours, being unable to see our way among the floes and through the lanes.

In the morning the weather proved thick, but we made some southing, and the fog fortunately clearing up at 11, we got sight of the bluff end of the island, and were enabled to shape a course up the inlet, and making all sail we passed the Black Rock at 4 p.m.; the ice, however, being still close and heavy, we were compelled to shorten sail at dark.

The following morning the floes became more open, and at noon we got sight of Investigator Island, in approaching which we were compelled to haul to the southward, getting very uneven soundings. At 3 p.m. Mr. Phayre landed, and deposited information at the cairn; we then worked to the eastward up the inlet, the ice being so open as to enable us to carry sail all night.

Making a long board to the southward, so as to determine the separation of Victoria and Wollaston Lands, we came upon some ice apparently aground about 6 miles from the shore, and tacked off it, the water shoaling to 10½ fathoms. Getting in with the south shore during the forenoon, Mr. Phayre was sent to put up a mark, and returned at 3 p.m. with some drift wood. The coast-line here consisted of a succession of low hills (100 feet), covered with fragments of yellow limestone; 5 or 6 miles inland they attained an elevation of 800 feet, and presented a continuous range in an east and west (true) direction. We continued working to the eastward along the shore throughout the night, standing off into 31, and in into 17 fathoms.

At 8 a.m. on the 9th of September, something like a mark was seen on a point, which on examination proved to be an old Esquimaux *cache*. During the day the wind failed us,

and unfortunately returned when too dark to ascertain its direction by the land.

There being no sun, and our compasses actually useless, we spent the whole of the 10th in working to windward against a fair wind. I had my misgivings early in the morning that we were still on the south shore, but not seeing either of the marks Mr. Phayre put up, I began latterly to think we were right. A ruddy sunset again produced a doubt, and a sight of the stars at 10 p.m. confirmed our error; when, as if to show how unworthy we were not to have made out when we had a fair wind, it died away, and before morning returned to its old quarter, the N.E. We then hugged the north shore, determined if possible not to let such a mishap again befall us.

On the morning of the 12th of September we found what appeared like islands in the centre of the sound, and passing between them and the north shore, low land ahead of us rose, and from the crow's-nest I could almost see it continuous. Retracing our track, we hauled across to the southern side, and being baulked there in like manner I sent Mr. Phayre to examine an inlet with a view of anchoring the ship, and sending exploring parties into both arms. It proved too shallow and too much exposed; and after picking the boat up we had the mishap to get aground working out. There was some swell, and a fresh westerly wind, which most providentially for us hauled to the southward; and just as the boat was on the point of dropping the stream anchor, she backed off.

After making numerous short tacks, and spending a very uncomfortable night, I ran into the north bight again, and despatched Mr. Phayre to look for anchorage in it, as we had passed over some uneven ground at the entrance, and it was not a fit place to enter without previous examination. In the meantime finding shelter under the lee of a point, the ship was anchored, and I went to the top of a hill, from whence I could distinctly make out that no channel existed in this direction.

TURN TO THE EAST.

I had therefore to consider now what to do. To remain where we were would be out of everybody's way. To return to our last winter quarters, we might be useful in the event of any parties entering the Prince of Wales Straits; but as it was evident that the people whose traces Mr. Parkes had met with on Melville Island were not Europeans, neither was it likely they had been in communication with any of our people (as in that case, instead of avoiding, as was the impression both of himself and party, they would have gladly come into communication with him), I did not think we could be so useful there as in the Dolphin and Union Strait. Hoping there was yet sufficient of the season left to reach the Coppermine River, where we should be in a good position to succour any parties who might have come to mishap, after entering the Strait between Capes Bunny and Walker (N. end Peel Sound), I could not afford to lose any time. Unfortunately the sun never showed out during the forenoon, and I was therefore under the necessity of quitting the head of the bay with very indifferent over-sea observations, and no true bearing. To the best of my judgment, however, the cairn we erected, which is on a hill about 300 feet high, is in lat. 70° 22′ N. and long. 112° 3′ W. The northern portion of the inlet extended 12 or 15 miles further to the eastward in narrow arms surrounded by low land, when the hills again rose, but did not in this direction exceed 500 feet in height; while both on the north and south sides of the sound the ridge rises to double that height. On the southern shore were several islets, affording apparently a well-protected anchorage; and in the bay where we were Mr. Phayre found a very well sheltered spot in which we could have wintered. The point we landed on was named Point George, it being the anniversary of the birthday of the son of Mr. Arbuthnot (who landed with me). Numerous *caches* showed it to be a favourite resort of the natives, but no very recent traces of them were seen. The lakes were all frozen over hard enough to bear,

which was not the case a fortnight later last year, and then we were 70 miles to the northward. Vegetation very sparse and stunted.[23]

[23] TURNING EAST.—Not till the 13th of September, 1852, did the captain of the *Enterprise* make up his mind to carry the search eastward; and even then he undertook it chiefly because every other course appeared to be either hopeless or impracticable; his own final argument was, that no vessels nor persons of any sort were to be found at Melville Island (little knowing that his dear friend Kellett was there looking for him), and he turned his head eastward with hesitation, and with no thought that he was about to open up a new route through the Arctic Sea, and come almost within sight of the veritable objects of the Search. It was fortunate as it turned out that he found no notice anywhere of the direction in which the *Investigator* had gone; for he said afterwards that had he known it, he would have followed her again round the west of Banks' Island.

In fact, that narrow channel that lies along the North Coast of America was, from its earliest discovery, considered impracticable for ships. It had been traversed from end to end in boats and canoes by various explorers, beginning with Hearne and Mackenzie, its first discoverers; Franklin, Back, Richardson, Dease, Simpson and Rae had all tried it in one part or another, and had all come to the conclusion given by Sir John Barrow (*Arctic Voyages*, 1818–46), that it was navigable by boats and canoes only, the eastern part being especially dangerous from the narrowness and rocky character of the channel, and also from the constant fogs and storms during the navigable season. And we see that that practical sailor, Kellett, warned Collinson off it; and that other Arctic navigators considered it impracticable and useless to attempt it from either side.

The bold adventure of the *Enterprise* in entering this discredited pass in the Arctic Sea fully confirmed all the former records as to its troubles and dangers, and yet demonstrated practically that it is navigable for ships; and it even gave the captain the conviction that it was the one most favourable line in which to look for a useful north-west passage. Of dangers and troubles there were plenty: constant thick fogs (arising doubtless from the warm easterly current); compasses virtually useless from Cape Bathurst eastward, very variable winds, neither sun, stars, nor land to be seen, ship drifting nobody knew in what direction, sharp plutonic rocks rising sheer out of the water; but with one great advantage throughout, a tolerably open sea. So great is the gift of a clear water channel in Arctic voyaging, that Captain Collinson did not hesitate to propose, after he had gone to Behring Straits again, to take his ship back through the same channel; and afterwards, in England, he undertook to carry a steamer through it and come out in Baffin Bay in one season. —[ED.]

Working to the westward, we came across our grounded

piece of ice again at 9.30 p.m. on the 14th September, and had this time as little as 6 fathoms; then crossing over to the north shore, for the purpose of leaving intimation of our intentions on Investigator Island, which we accomplished at 4 p.m. on the 15th September, we again made sail for the S.W. point of the Sound (Prince Albert's), having now satisfactorily established the fact that Wollaston, Prince Albert, and Victoria Lands are all one. We reached the western extremity at 3 p.m. on the 16th, which is a low sandy point, to which the name of Cape Austin (Cape Baring) was given; and rounding it, bore away to the southward, passing a steep bluff; and then seeing the land take an easterly turn, I hauled off to the westward for the night, not wishing to enter the Dolphin and Union Strait except in daylight. When it came we made the bluff, and passing it, reached a low point, which at first we took to be an island, but afterwards found it to be a peninsula, at 9 a.m. This I had a melancholy satisfaction in naming after Lieutenant Kendall, not only in token of my esteem for his memory, but as the first discoverer, on the 4th of August, 1826. It is low (150 feet), and immediately to the N.E. of it is apparently a fine harbour. The land about it is low, and at the back of it is a conical peak. The mountains do not rise until 7 or 8 miles from the sea, and then attain an elevation over 1000 feet. On the high range is a remarkable saddle peak. September 17th, the westerly wind failed us at noon, and afterwards drew to the eastward, against which we made short tacks, standing to within a mile of the beach, on which were one or two black spots, very like the wash of sea coal. By nightfall we reached a high bold bluff, 13 miles to the S.E. of Cape Kendal, on each side of which were deep bights, but apparently exposed to the S.W. Off the bluff there is a ledge, on which we got 9 fathoms, the water deepening to 18 in shore of it. In the morning we found, either owing to currents or missing a slant of wind (from the uselessness of our compasses), we had made little or no progress; and the wind remaining light during the day, we made little or nothing. At night I crossed over to the continent, and when near mid-channel we came across some

heavy floes, but with this exception had seen little or no ice during the period we had been in the straits. On Sunday afternoon, September 19th, we worked up into South Bay, getting some very uneven soundings, and at 8 p.m. rounded Cape Bexley.

After midnight we got the wind from the N.W., which enabled us to lay a mid-channel course; but not knowing how the current might run on this shore, I hove to after making 16 miles. When daylight broke we got hold of Sutton and Liston Islands, but by reason of light winds did not get within 5 miles of them until 11 a.m., when I sent Mr. Phayre to erect a mark and deposit information. We remained becalmed or scarcely making any progress until his return, which was at 5.30, when he reported that instead of two there were three islands. On the beach was a considerable quantity of drift-wood, and an Esquimaux grave, with other signs, which showed that they are very likely frequented during the spring for seal-fishing. The wind being too scant to permit our passing to the south, we rounded the north end of the islands, and getting into 11 fathoms about 2 miles to the N.E. of them, we hauled to the north, and deepened to 25; then we kept again to the southward and eastward, heaving to half an hour after midnight.

During the night, September 21st, we must have experienced a strong set, as when day broke the islands were not visible. Under our lee was a long ow point, which apparently still formed part of Wollaston Land; hauling to the wind on the starboard tack, we shortly afterwards got into 4 fathoms, and then stood to the north-westward, towards a low rocky islet, but getting into $3\frac{1}{4}$ fathoms in this direction, were compelled to tack again. Most fortunately the morning was clear, and we were able to see about us, and soon made out Mount Barrow and Cape Krusenstern, but could not reconcile our position with that of the islets we were among. We therefore worked to the southward and westward, passing between the low rocky islet mentioned above and another which was higher (40 feet), and on which we saw a deer. As they are neither of them near enough to the main for Lam-

bert Island, and which we could not distinguish, I have retained the names of Bayfield and Douglas; but our longitude both yesterday and to-day is 20 miles to the westward; whereas at Cape Bexley we agreed very well. Sir J. Richardson had no chronometer with him, and mine are over-sea observations, which, with a meridian altitude of 22°, are open to great error.

By noon we weathered the west end of Douglas Island, passing it at half a mile, and having 5½ fathoms. To the south were three other islets, but seeing the sea open to the eastward, I bore away in that direction. We found Douglas Island separated from a low point (which I still assume to be part of Wollaston Land, and named Point Becher) by a channel 4 miles wide, which I was inclined to have tried in the morning, as it would have saved me a distance of 4 miles to windward; but the uneven character of the soundings prevented me. It will however, I dare say, be found a good passage, as we had nothing under 20 fathoms, after passing the S. point of Douglas, until we reached Becher Point; 4 miles to the east of which, and 1 mile off shore, we had 9 fathoms; and then ran along the coast, which appeared nearly straight, and without any marked feature; the hills being low, and all about the same height for 30 miles, when we came to three small black cliff islets, lying in an E. by N. and W. by S. direction, the outer being 5 miles from the shore.

Having passed these I hauled up close to the shore, and came to anchor a short distance to the east of them, in 14 fathoms, half a mile from the shore, at 8 p.m. To the east of us was a small bight, apparently shallow, with a shoal off its west point.

When day broke (September 22nd) we were again under way, and found the coast trend more to the north. At the distance of 10 miles we passed two small islets, 4 or 5 miles from the shore, the coast-line beyond them taking a north-easterly trend; and from the masthead we could see that it was separated by two arms of the sea, the western of which may form a channel, and cut off a portion of Wollaston

Land, as we did not see the whole of the coast-line continuous opposite to Liston and Sutton Islands. Immediately to the S.E. of these two inlets the hills rose abruptly from the sea, towards the south end of which we shaped a course; while to the southward off-layers from the Sir Everard Home and Jameson Islands stretched across our path.

Favoured most opportunely with a fine day, we found a convenient passage between two of them, which I named after my friends Captains Kellett and Bate. The former rises to the height of 500 feet, and has apparently a good but confined anchoring place near its S.W. end. The latter lies 6 miles south of it, is low with large boulders on it, with three flat reefs off its S.W. point. Kellett Island is separated from Victoria Land by a channel 4 miles wide, and here, as mentioned above, the hills for the first time rise abruptly from the water-side. This range, to which I gave the name of Sir J. Richardson, continues along the coast for 20 miles, presenting several fine bays, three of which will, I think, be found excellent harbours. The grassy slopes (on which several deer were seen) afforded a pleasing contrast to the low barren ridges we had hitherto seen.

Near to the east end of the range, and at a short distance from the shore, are four small islets, after passing which we came again upon our dull yellow limestone district, which caused many of our party to cast a lingering look at the range behind us, and hope there was just such another in store for our winter quarters to the eastward. Having made 72 miles during the day, I brought up for the night in 6 fathoms. The current, as last night, was found to set to the eastward during the whole period we remained at an anchor, and during the middle watch it attained a velocity of 1 knot per hour. The wind shifted to the S.E., and we had barely room to get off shore. No ice was in sight, and a head sea was looked upon as a comfortable indication of plenty of open water.

At 3.40 p.m. (September 23rd) we got hold of Cape Franklin, bearing S.S.W. true, and tacked off that shore about 2 miles in 10 fathoms. Making short boards but nearly in

mid-channel, or if anything, as we supposed, over towards the north or weather shore, we ran the ship aground in the act of staying at 2.30 a.m. Fortunately being the weather shore, the water was smooth, and she came off after some labour at 3 o'clock. The bay ice, however, had begun to make wherever the water was not disturbed, and showed that the season for navigation was nearly at an end. I certainly thought I had given the ship room for any shift of wind, but unless the stars or sun are out, or you can see the land, you are perfectly at a loss to know which way the ship's head is, and the only guide we had was the trust that the wind would prove constant during the eight hours dark. Making sail we passed a small islet close to the shore, by which I presumed the scene of our mishap was Byron Bay.[24]

[24] THE MAGNETIC COMPASS.—It is not yet known what is the source of that peculiar attractive force which exists in the substratum of our globe, and which causes iron bars, when charged with electricity and freely suspended, to point towards the North Pole in whatever part of the globe they are placed. The direction, however, is not precisely to the North Pole of the earth, but to a point near it, at 96° 45′ 48″ W. longitude, and 70° 5′ 17″ N. latitude. This point was discovered by Captain James Ross in 1830 by the circumstance that the magnetic needle pointed directly downwards. Hence, in voyaging by the magnetic compass, correction has to be constantly made for the variation of the needle (it is called a needle, though it is really a slight pointed bar of iron) from the true north. And this correction is complicated by the variation varying, not only according to latitude and longitude, but from year to year in the same place; and there is even a daily variation, which two latter changes seem to indicate that this magnetic or electric force has some connection with the other heavenly bodies. Moreover, as every material body exercises some magnetic influence, but especially soft iron, the magnetic needle is easily affected by the proximity of masses of this metal; and, of course, as the position of any iron in a ship changes with respect to the needle, as the ship's head changes, this influence is a very troublesome one to deal with. But the Arctic voyager has a still further difficulty with his compass. The nearer the approach to the magnetic pole, the more the needle turns downwards towards the earth; and the voyages within the Arctic circle are all so near to it that this "dip," as it is called, is considerable; and this, or the proximity of the pole, appears to give such an uncertainty to the action of the needle, that a very little external influence renders it quite useless for purposes of navigation. Complaints of this defection, and of the difficulties arising from it, are to be found in all Arctic

travels. And it becomes very serious in the fogs which are so frequent during the sailing season; out of sight of land, without the sun and without the compass, with a slack current and a changeable wind, the poor voyager gives himself up in charge to the ice floes.

*Discovery of the Magnetic Pole.*—"On the shores of the sea to the west of Boothia Felix, Sir James Ross made observations of declination and dip, and calculated the position of the magnetic pole.

"On reaching the calculated position attempts were made to determine the magnetic meridian by suspending a dipping needle, first by means of a single fibre of silk, and afterwards by a single fibre of flax, and also by finding in what direction a given number of vibrations was made in the shortest time, but no result could be obtained. Six sets of observations were taken in what seemed to be the most probable direction, and at 45° and 90° to it, and the mean of all the observations gave the dip 89° 59′." —*Arctic Manual*, 1875.

The *Arctic Manual* of 1875 contains notes of all the magnetic observations made in the Arctic seas during the previous 60 years, and refers to a paper by General Sir E. Sabine in the 'Philosophical Transactions, Royal Society, 1872,' Part II., being a magnetic survey of the Arctic Regions. In this he says that the recent observations support the theory of Halley (1683), that: "The globe of the earth may be regarded as one great magnet, having four magnetic poles, two of them near each pole of the equator; and that in those parts of the world which lie near any of those magnetic poles, the needle is chiefly governed thereby, the nearest pole being always predominant over the more remote."—[ED.]

As we opened Wellington Bay the wind freshened, and in reefing we unfortunately split our foretopsail. I therefore wore, in hopes of getting back to the neighbourhood of where we had got on shore. The wind, however, drawing to the north, edged us off, and freshening, I had only to congratulate myself that by carrying a press of sail we had weathered Cape Franklin, and got into a wider space, where we should have a better chance to brave the equinoctial gale into which this wind was rapidly freshening. By sundown we were under close-reefed topsails, and passed an anxious night, wearing in each watch, which was an arduous operation, the sea breaking constantly over us, and freezing immediately, the thermometer having fallen to 11°.

Morning broke (September 25th), and with it better weather, but it took us the greater part of the forenoon to clear our decks and sponsons of ice. Making sail as soon as this was done, we reached the northern shore, having passed through

a stream of bay ice, and at 7.15 came to anchor in 7½ fathoms. Fearing the maintopsail might play us the same trick as the fore, it was shifted, and we were in a fit state, with two nearly new sails, to look at the Finlayson Islands and Cape Alexander.

The bay ice made about us during the night, and, although I did not like the appearance of the morning (September 26th), there was every likelihood of our being set fast if we remained. Weighing therefore at 6, the day cleared up a little, but still remained so hazy as not to permit our seeing the Sussex Mountains or Wellington Bay. At 12.45 we passed between the two westernmost islets of the group, and at 2 passed to the north of the largest islet, between it and another, the channel being about 3 miles wide with a reef near mid-channel on which the ice was lodged; it was a great risk, but still better than remaining on the weather side of them all night. The least water we got was 6 fathoms; then hauling up towards the Victoria shore, and passing another islet, we speedily got into smooth water, and came to anchor in 12 fathoms, within a mile of the beach. The wind freshened during the night, and it was with great gratitude I considered that we were at anchor under the lee of the group (Finlayson), instead of at sea to windward of them.

### ARRIVE AT CAMBRIDGE BAY.

The bad weather continued the whole of the next day (September 27th), but we were in smooth water, and comparatively well sheltered from all quarters except the S.E. The bay ice kept streaming down upon us, and I began to fear we should find the head of Cambridge Bay choked with it.

Towards noon on the 28th of September it moderated a little, and the haze clearing off, enabled us to see our way. We weighed, and ran to the S.E., looking anxiously for the islets laid down by Simpson, under one or other of which I hoped to obtain shelter. We were scudding along under double-reefed topsails and foresail, at the rate of 6 knots, when, at a distance of 5 miles from the land, the ship took

the ground. Fortunately it was merely a graze, and hauling to the south we soon deepened our water.

Having made out the S.E. point, we altered course to the northward, and, passing to the south of two low rocky islets, rounded a low point which promised to afford us the required protection. Off it were some pieces of ice aground, and having passed them I thought we were all safe, and hauled up into the bight; the water, however, shoaled suddenly, and, although all our sails were immediately thrown aback, she took the ground forward. The sludge was so thick that we had great difficulty in laying out our stream anchor, and that proving ineffectual the boats were hoisted out, and we commenced sending our deck-load of provisions to the shore.

On the morning of the 29th of September, when the tide was at its highest, we got a strain upon our stream cable, but without effect. The bower anchor and stream chain was then laid out upon the port quarter, and we commenced discharging our stone ballast, and clearing the forehold. The sludge rendered the communication with the shore very precarious, the boats sometimes being within half a cable's length of the ship, and not getting on board for an hour. A guess warp was laid out to the shore, which, with the boat's sails, somewhat assisted us. Unless, however, the boats entered it with way upon them and a free wind, they were often brought to a standstill. I saw the cutter in one instance remain stationary half an hour, although there was as much wind as the mast would stand.

On the 30th of September the communication was completely cut off, and our dogs made their way over the ice to the ship; all the weights were removed aft from forward, and we again got a heavy strain on the cable without success.

On the 2nd of October the ice was firm enough to admit our walking across it to the shore. A tide pole was fixed in the ground ahead of the ship, where the least water was found to be 7 ft.; under the bows were 9 ft. 6 in.; and under the stern 16 ft. 6 in. at low water. The people were occupied until high water in making a canal astern of the

ship, and loosening her sides from the ice. We got all the strain a threefold purchase of 4-inch whale line would stand, but without success; and when the tide began to leave us, got out our chain cables on the ice, which as yet would scarcely bear them. The best bower anchor was put into the pinnace on the ice, and all the stores removed from the carpenter's and boatswain's store-rooms, the starboard bread-room cleared, and the fore-hold clean swept.

But greatly to our discomfort we found at high water (Oct. 3rd) that the tides had begun to take off. Under these circumstances I determined to forego our labour, as the constant exposure to wet was beginning to have an effect upon our people. Since we had been ashore, I had issued half a pound of pork in addition to the daily rations, which sent them to work in the morning with a meat breakfast. The sludge about the ship was 10 and 12 ft. deep; and such was its consistency that immediately a block of ice was cut out and removed, the hole filled, and having exactly the same appearance as the firm ice, many of the men fell in.

Five natives made their appearance, and being brought alongside, one of them, the eldest, after some hesitation, consented to come on board; and after getting him down into my cabin and making him some presents, he felt reassured, but it was evidently their first communication.

On the 4th of October a shooting party was sent out and fell in with the native encampment. On board we surveyed our chain cables, hauled three of the boats up on shore, and erected a flagstaff.

## SECTION XII.

### CAMBRIDGE BAY.

### WINTER, 1852–3.

THE ice being now in a fit state for a travelling party, Lieutenant Jago was sent to the S.E. point of Victoria Land, with directions to trace the coast-line and erect marks on Cape Colborne, and such other points as would be likely to guide persons to the ship. One large and two small balloons were sent away with papers describing our present positions, and the places where provisions were deposited.* The shooting parties brought in ptarmigan, but were unsuccessful after deer, although many were seen. On the 6th of October, the morning being fine, I set out for Mount Pelly, which for the first two days the haze had prevented our seeing, and led me to the uncharitable surmise that the mountain had been made for the Director.† Now, however, there was no mistaking Mr. Simpson's accuracy; and I have great pleasure in bearing testimony to the value of his chart, being only surprised with the means at his command, he could have accomplished so much. Making straight for the mountain, at the distance of less than a mile, we got off the sea-ice on to low land, and crossing the isthmus, 2 miles wide, came on an inlet which forms a capacious and excellent harbour; putting up a large pack of ptarmigan, out of which we got two, we then crossed the inlet, which proved from 2 to 3 miles wide; and after a sharp walk of four hours, over a low but undulating country, abounding with lakes, we reached the summit

* See Note 19, p. 168.

† Sir John Pelly was Director of the Hudson Bay Company. Messrs. Dease and Simpson (of the Hudson Bay Company) surveyed this coast by boat in 1836–7.

at noon, which the aneroid proclaimed to be 800 feet high. Unfortunately the white misty haze, peculiar to Arctic regions, had begun to spread, enveloping everything with a sameness, the only objects standing out in relief being the ship, and a blue hole of water in Dease Strait. The extremities of the points, islands, lakes, and hills, formed one mass of confusion, which it was impossible to separate, and it was useless to put up the theodolite; so building a mark and partaking of a very cold collation, we made the best of our way back, fearing the mist might occasion the loss of our way. The hill is, however, a very remarkable one, rising very steep on its southern and eastern faces; the summit is nearly level; at its western foot was apparently a very extensive lake. A balloon was sent up, and a fawn weighing 46 lbs. brought in by the shooting party.

On the 7th of October I commenced the survey of the bay, digging holes through the ice to obtain soundings, it being of a convenient thickness (5 inches) for that purpose. Parties were out shooting, collecting turf and stone ballast. The following day was spent in the same manner, and a base measured.

Mr. Jago returned on the 9th, having traced the East Coast round by Cape Colborne to Point Back, and here finding a deep inlet, he took advantage of it to return to the ship, crossing an isthmus 18 miles wide. Bay ice was collected close in shore, and the inlet was frozen over; but the sea to the eastward was still one vast expanse of water. The deer had accumulated in large herds on the peninsula, waiting for the ice to form a bridge for their passage to the continent; on their trail were several wolves, and a party of natives were hanging about them, from whom he purchased a couple of very good dogs.

Some of the deer crossing the ice occasionally within gunshot, we got our two twelve pounders out, with a view of trying the effect of shrapnel shell. After church on the 10th of October, nine natives came on board (not the same party that had been with us on the 3rd); but they had evidently been acquainted with our peaceable intentions, and though showing some alarm, soon acquired confidence.

The tides having begun to make, we commenced cutting a canal astern of the ship. The frost had now penetrated 3 feet into the sludge, rendering the operation very tedious. The whale lines and hawsers were got from out of the holds and store-rooms, and coiled on the ice. Each day the canal was cut, and at high water a strain brought upon the purchase, and immediately the water began to fall, we set to work to lighten her, clearing the main and after-holds. A 6-inch whale line was rove through a top block fast to one of our largest ice anchors astern, and one end being brought to the capstan, the other was secured to one of our quarter bollards, while the threefold purchase on the cable was brought to the windlass; we broke the ice anchor, and then put down our heavy kedge. In order to clear the sludge away, large wooden scrapers were fitted, but it appeared a labour of Sisyphus. We tried to cock her by sallying from side to side, and by mast-head purchases, but it was not until 11.30 a.m. on the 15th of October that she came astern as far as the ice was cut. Twenty-five natives visited us, and proved very well-behaved, which was so far fortunate, as nearly everything was out of the ship on the ice. Small things such as were likely to excite their cupidity were carefully hid; but the casks, iron hoops, and meat tins, must have been a great temptation; no attempt, however, was made to thieve, and they earned for themselves the reputation of honest men.

By the 18th we were well afloat, and commenced taking in our provisions and stores. A continuation of this labour, however, would have given me a sickly crew for the winter, and therefore I reluctantly gave up our canal cutting on the 25th of October, and had to rest content with 17 feet water under the bows, and 24 feet under the stern. Our situation was exposed from S.E. to S.W., but I hoped, ere the ice should be in motion in the spring, we should be able to get into a well protected little cove less than a mile from us.

Being fixed for the winter, the main deck and forecastle housings were spread. The natives continued to visit, but notwithstanding all my endeavours, we did not succeed in geting any venison or fish from them, until my steward

(Bulkely) being out shooting, fell in with one of their sleighs crossing the inlet, on which were several fine fish, one of which he succeeded in purchasing for a knife; and he returned on board with what we at first took to be a large log of firewood on his shoulder, but proved a salmon 39 lbs. weight. This opened the traffic; but they brought a very little, although I made a great display of our wealth and ability to purchase. In re-stowing our holds, the after part of the main was left vacant, so as to admit two tier of hammocks; and a platform being laid over the tanks, eighteen men were berthed down there during the winter.

On the 1st of November I set out with a sleigh and seven men to visit the continent, making direct for Cape Alexander; the first 4 miles proved very rough travelling; but we then got on smooth ice, and camped at dusk about 6 miles from the largest Finlayson; setting out again the next morning, and finding the day likely to prove hazy, at 9 I despatched Hester and Chartres to Cape Alexander, and struck in with the sleigh for Cape Trap. On getting within a mile of the islets off it, we found the ice very rotten, and fearing the sleigh would fall through, I camped where it was firm. So soon as we had our dinner, Gowan and French were sent to walk along the coast to the eastward, as far as daylight would admit, looking for cairns and depositing information: the latter having been with Mr. Parkes on Melville Island, may be said personally to have connected the link between the discoveries of Sir E. Parry and those of the American Continent. In the meantime I erected a mark on the largest islet, and upon the Cape, but was disappointed in my hope of obtaining a round of angles, the weather being too hazy to use the theodolite. We fell in with several old *caches*, and saw one or two hares. At dark neither of our parties had returned, and I began to fear the Western one might be benighted. We had, however, but just sat down to supper, with the intention of going out to look after them, when they made their appearance. The latter, on their passage to Cape Alexander, passed two low rocky islets to the south of Finlayson, which escaped Simpson's notice, and

caused me to think how very fortunate it was we had not taken that passage on the night of the 24th of September. Having thus distributed notices of our whereabouts along 25 miles of coast, we set out on our return the next morning, and camped within 10 miles of the ship, which we reached at 11.30 the following day, having passed a very cold night, and getting two of our party slightly frost-bitten by the bleak wind in our faces. One of our new dogs ran away from us in the morning, and showed a strong instance of their sagacity. He had made his escape from the ship several times previously, and was brought back by the natives, and knowing his propensity, he was tied up every night; but this night, thinking he could not tell his way, as we were camped in the middle of the strait, I desired him to be cast adrift. In the morning when I got up he was there, and the day so hazy we could scarce see the land. However, while we were at breakfast he set off, and on following his footsteps some distance, I found that he was making straight for the Huski camp.

Mr. Jago left the ship the same day as I did, and succeeded in purchasing 373 lbs. of good venison, and 200 lbs. of dog's meat. The natives also visited the ship daily, bringing with them small quantities of fish and venison. A balloon was put up on the 2nd of November, and a fox caught and turned adrift with a collar on his neck.[25]

See Note 25, Appendix: WINTER OCCUPATIONS.

The ship's side was banked up with snow, and we attempted to get our hempen stream cable, but found the sludge frozen to the depth of 4 feet; I had therefore reluctantly to abandon it for the winter. The upper deck was this year covered with 6 inches of snow, and the surface gravelled. A large porch was built opposite to the entering port, and the fire-hole in it used for the tide-pole. Two ravens were seen on the 13th of November; the observatories being finished and the boats covered in, the pinnace, one cutter, two whale boats and dingy, being placed on the ice near the ship instead of on shore: the skittle alley

was commenced, and being roofed with slabs of ice, and gravelled, formed a very superior place to that of last year. The light beginning to fail, and there being much more snow-drift than last year, the quarter-deck housing was spread on the 24th. The deer had all left us: the ptarmigan became scarce, and but one hare shot. The weather, however, was generally too bad to admit of shooting parties going out. On the 27th of November we had the novel spectacle of seeing the sun and full moon pass the meridian within half an hour opposite to each other, both being about the same altitude.

Our theatre opened with great éclat on the 2nd of December, and was to be continued every fortnight. On the 9th three natives visited us, being the first we had seen since the 10th of last month: they were admitted below, given something to eat, and shown a place in the square of the main hatchway on the orlop deck, where they were to sleep; and after enjoying the singing, dancing, and fiddling on the lower deck, they went to bed very quietly. Friday morning, however, being the weekly day for the inspection of the men under arms, they unfortunately took alarm on the muskets and cutlasses being got out of the arm racks, and went off before I was aware of it. However, on the 23rd of December we had a visit from fifteen more, who, no doubt, had heard of the hospitable treatment the others had received, and were admitted below; we tried to explain to them that we had accommodation for three or four to sleep, but that we could not accommodate the whole party. Some preserved meat and rice was given them to eat, and they all took their leave in the course of an hour. Several articles were, however, secreted and stolen by them on this occasion; and this, with the bad odour which the high temperature (to them) of our lower deck caused their persons to reek with (all of them being in a violent perspiration), induced me to forbid their being admitted between decks unless on special occasions. On the 16th of December, being our theatrical night, in addition to the 'Beggar's Opera,' which was very fairly performed, we were favoured with a very handsome Para selenæ (παρα σεληνη): three false moons appeared, one on each side, and one vertical

with a bright arch nearly connecting the three. Above the vertical one was the segment of a smaller circle, the lower portion of which only was seen. The skittle alley proved a great resource to our people, giving them healthy exercise in a spot protected from the wind, which seldom admitted of our going abroad. Seeing that something was required to aid it, a billiard room was built, the table being formed of blocks of snow, the upper surface of which was puddled, and an ice rim frozen round it; fresh water was then poured upon it, which froze into a compact sheet; but many air-bubbles appearing on the surface, it had to be scraped; the pockets were then cut; and finding our ice cushions were not sufficiently elastic, the carpenter was not to be balked, but getting a walrus hide, and stuffing it with oakum, he made capital cushions; and then finding the grape-shot we had recourse to for balls too heavy, he produced some made out of our lignum vitæ, which, considering he had no turning-lathe, quite surprised me. I do not suppose any of the men had ever played at billiards before, so they could not complain of the table; but the thing took admirably, and gave them what I wanted, occupation off the lower deck of their own accord.

Mercury froze on the 15th of December, and the whole of the remainder of the month proved very cold, reducing its mean temperature 10° below that of March, the coldest month last year.

On the 26th of December 11 natives visited the ship; hitherto they had arrived from the westward, now they came from the continent, which, considering the short duration of daylight, must have been more than two days' journey. Another party of 25 came on the 29th; we tried to persuade three of them to remain, and two having been left behind, when the main body went away, I had them invited below; but after the party had gone upwards of a mile, two of them returned in much alarm, having their knives ready in their sleeves; the appearance, however, of their comrades from below reassured them, and they went away satisfied no harm was intended. Among the party were several boys, some not more than 12 years old; and it was quite surprising to

see with what impunity they bore the cold, nor did they appear tired, never sitting down or taking any rest on their arrival.

At the close of the year we had 5 men upon the sick report, and I had every reason to be thankful that the health of the ship's company, generally speaking, was good, though not equal to what it was last year. As yet the scourge we had most to fear, had not made its appearance virulently; some cases had occurred among the officers. Mr. Woodward (boatswain) was under treatment 33 days; Mr. Arbuthnot (ice mate) 15. In Mr. Waldron (carpenter) it was combined with acute rheumatism. Mr. Atkinson (ice mate) was also slightly affected, and Wm. Driver (ship's cook) was afflicted with it in addition to other diseases when he died in May last. Sergeant Jeffery also suffered slightly from it; he had been already 482 days under the surgeon's care, with pulmonary consumption; now, however, he was able to get about and perform a portion of his duty. Three of the men ill at present were doubtful cases, but as yet the disease was not confirmed in them. Our casualties in frost-bites were as follows:—in the sick list under a fortnight, 9 cases; between that and a month, 2; 1 case, 93 days; 1, 115 days; 1, 83; and 1, 103. In the last four cases the knife had to be used, but without material detriment except in one instance; but these latter, although capable of doing their duty about the ship, were not fit for a long travelling party. The general abstract of the daily number on the sick list is given, by which it appears that seven per cent. is our average.[26]

See Note 26, Appendix: HEALTH.

1853.—At the commencement of the New Year the school was established and the game laws relaxed, each person being now permitted to shoot on his own account. On the 7th we had a gang of no less than 40 natives, who, no doubt encouraged by wee things occasionally picked up, now began to be rather troublesome, occasioning a quarter watch to be constantly looking after them. They generally returned after an absence of 48 hours, bringing nothing with them for

barter and requiring incessant vigilance. By distracting the attention of the sentry, they managed to get into the observatory, and stole a candlestick, which was not reported to me until 6 days subsequently, and the opportunity lost of discovering the offender. However, warning was given that in cases of theft somebody would be punished, either Huski for taking, seamen or marine for permitting. This led to greater vigilance, and by way of showing we were in earnest the sentries were armed with cutlasses. One impudent young fellow, noticing the pocket in which I generally carried beads, buttons, and halfpence for the children, made several attempts to introduce his hand. I showed him that it would lead to punishment, but the temptation was too great; before, however, the hand could be withdrawn, mine was across his face; the blow was either more severe than I intended or else claret flows more freely in cold weather; this treatment made him rather indignant at first, but he soon came to his proper senses, and was then given a ring, which produced abundance of *ko-wan-na-s* and *teymas*.

The upper limb of the sun showed itself on the 8th of January after an absence of 39 days. Towards the middle of the month we had much bad weather, which prevented our getting out, and also the natives from coming to us; but on the 26th they returned; some parties were much better behaved than others. On the 27th we had a little girl, who I am sure could not have been above eight years old, who being taken much notice of, the next morning we had children of all ages from infancy to manhood. One little boy of four years old was attired in a bear skin suit of one piece, which served for hat, stockings, and everything else; how he got into it was a mystery at first, until his mother showed the invention. One small thing, not yet capable of walking, poked out its naked hand every now and then from its mother's hood, where it was carried at the back of the head, the temperature being at the freezing-point of mercury, that is to say 71° below the freezing-point of water. How they could possibly endure it was quite surprising. I narrowly escaped being frost-bitten, by merely taking off my mitts to

give them a few beads. Great temptations were offered them to bring us venison or fish, but they evidently had it not to spare. Their clothes, however, which were remarkably good, they were very desirous to dispose of, taking any old suit of ours eagerly in exchange. A fine healthy ruddy appearance, however, showed there was no lack of food, and they afforded a strong contrast to our people, on whom the second winter and severe season, together with long exposure to candlelight, had given quite sallow complexions. The month proved one of the, if not the, coldest ever passed in these regions, the mean temperature being −38°.

In February we commenced the examination of our preserved meat rooms, and found 12 per cent. (a very large number) of our tins destroyed owing to their being packed in bulk in too large quantities. Fortunately we had a large supply, and therefore were not under the necessity of reducing the allowance, while the condemned provision did for feeding our dogs.

The roof of the billiard room proving rather too low, the walls were raised 5 feet, and panes of transparent ice inserted in the sides, by which we obtained daylight sufficient to play. On the 10th of February the thermometer against the ship's side rose to +26°, and we had the sun 7 hours above the horizon; the water ran upon the bulwarks on the 21st. Towards the latter end of the month we commenced making a *cache* on a reef, one mile to the south of the ship, and collecting stone ballast. One native visited us on the 26th.

On the 1st of March a man, his wife and 2 boys came on board and remained until noon. We commenced putting our sledge gear in order, and furling the quarter deck housing; on the 14th a skylight was fitted to the main hatchway. Shooting parties obtained little or nothing, and a nearly constant breeze caused the cold to be severely felt, obtaining for our present winter quarters the name of Windy Nook.

We began to get our stone ballast alongside, and the *cache* being finished, the following articles were deposited on

Simpson Rock. Biscuit, 100 lbs.; pork, 320 lbs.; oatmeal, 2 bushels; sugar, 30 lbs.; tea, 5 lbs.; chocolate, 20 lbs.; rice, 30 lbs.; with a quantity of ammunition and some presents.

On the 20th of March we availed ourselves of a visit from the natives to purchase 3 dogs; and on the 21st Lt. Jago, with two sleighs, was dispatched across the land to Point Back in order to select the best route, and lay out a portion of the provision for the long parties. He returned on the 23rd, not having reached the sea on the opposite side, but reporting the land travelling good.

Sufficient daylight for our balloons being now apparent, several were sent away towards the close of the month. On the 28th 3 sleighs left the ship with provisions for the long parties. I accompanied them as far as the depot, finding the land but little elevated above the sea and interspersed with numerous lakes. Then leaving Lt. Jago to carry the provision 4 days' journey farther, I returned to the ship on the 30th. In the meantime the spirit-room was cleared, and a strict examination of the provisions there stowed took place; the coals were removed to the coal-bunkers, and a quantity of stone ballast put in their place.

The weather not admitting of my departure earlier, I left on the 2nd of April in order to examine the Finlayson Islands, and reached them on the following day. Unfortunately the weather remained very thick, and my provisions being expended, I was compelled to return on the 7th, without accomplishing my object, having only obtained one round of angles. I was also disappointed in not meeting the natives, as this appeared the direction from which they usually came, but no recent traces of them were seen, although numerous *caches*, and stones stuck up so as to decoy the deer, showed they are places of great resort at some season. On the 6th, while on the largest island of the group, 4 deer crossed from the continent to the north, being the first we had seen this season. Lt. Jago returned the same afternoon, having carried a large portion of our provisions 5 days' journey to the eastward.

I ought not to enter upon our summer occupations without taking leave of our theatre, which closed for the season on the 26th of last month, having been carried on with such success as to call for a weekly performance instead of every fortnight. Great credit is due to all parties concerned; but especially to the manager, Vincent Bulkely (my steward), who entering fully into the spirit of the business, got through a world of difficulties, producing each night some novelty, and attracting unbounded applause; in fact seldom, I believe, were more ends got from the simple means we had for the purpose, as no preparation had been made either in England or Hongkong. The occupation and enjoyment which it gave were both productive of good, without I am glad to say, any counter-check.

During my last absence the after-hold was restowed and the provisions examined, the coals in it being removed to the bunkers, and ballast put in their place.[27]

[27] EASTERN EXPEDITIONS, 1852–4.—While the *Enterprise* was working her way to the eastward along the coast of North America, quite ignorant of the position of her consort, and of the proceedings of Captain Austin's ships, a great stir had been made at home on the return of those ships. And a still more elaborate expedition was dispatched to the eastern side in the spring of 1852. The *Assistance* (Captain Sir E. Belcher, and Commander G. H. Richards) with a steam tender, the *Pioneer* (Lieut. Osborn); and the *Resolute* (Captain Kellett, just returned from Behring Strait), with its steam tender, the *Intrepid* (Commander M'Clintock), and a depôt ship, the *North Star* (Commander Pullen), to be followed to Beechey Island by the steamer *Phœnix* (Commander Inglefield).

In point of organisation and equipment, and plan of search, this was a model expedition; the one fault in it was, that unfortunately it went in the wrong direction. There was to be a central depôt (the *North Star*) at Beechey Island, from which two vessels (*Resolute* and *Intrepid*) were to go westward to Melville Island, and two vessels (*Assistance* and *Pioneer*) northward up Wellington Channel. Both divisions were, of course, to look primarily for the missing expedition; and now in addition, for the two ships on the western side. Sir E. Belcher added another excellent arrangement by fixing a rendezvous, to be touched at by the exploring parties of both divisions, so that they should keep up connection with each other. And, lastly, the *Phœnix* was to communicate with Beechey Island from England every summer till they returned.

And so far as concerns exploring, and communicating, and providing, and observing, the whole was admirably carried out. Of course, they

found no trace of Sir John Franklin's ships; but they found and rescued the crew of the imprisoned *Investigator*. The expedition did not arrive at Beechey Island till August 11th, 1852, having been much detained by ice in Baffin Bay, this having been a bad season in the Arctic seas. The northern division (under Sir E. Belcher) wintered in Northumberland Sound, at the N.E. corner of Wellington channel. The western division (under Kellett) wintered at Dealy Island, on the south side of Melville Island; and in October 1852, Lieutenant Mecham found the record of the *Investigator's* position deposited by M'Clure in May of the same year, at a place that has become historical in the Arctic Sea, a large mass of sandstone rock in Winter Harbour, engraved with the names of the *Hecla* and *Griper* in 1820 (a sketch of this stone is in Osborn's *N. W. Passage*, ed. 1856); but unfortunately he did not find the record of Lieutenant Parkes of the *Enterprise*, left also in the previous May. Such are the failures of want of *pre-arrangement* in the general measures for the search.

The *Investigator* lay in the Bay of Mercy on the north side of Banks Island during the winter 1851–52, ignorant of the presence of her consort on the S.E. side of the same island; and during the summer of 1852 she never moved, the ice never giving way sufficiently. A heart-breaking position; both in the summer of 1851 and again in 1852 she could see a channel of open water extending to the eastward so far as to raise the belief that in each year the short remaining link of the N.W. Passage could be made by it; a narrow belt of ice only intervening, but of such a massive character that to force a way through it was hopeless. The probability of so effecting the Passage was somewhat confirmed by the several sledge expeditions which crossed the channel to Melville Island in 1852–54, and which found a considerable extent of smooth ice in it of the character of *New* ice, that is, of one year's formation; and which might, therefore, be expected to be dissolved each summer. But the belt of heavy hummocks along the south coast of the channel seemed to be an impassable and perpetual barrier.

The variation of seasons is another obstacle. On Sept. 24th, 1851, the *Investigator* entered Mercy Bay, then quite free of ice. On Sept. 24th, 1852, she lay still in Mercy Bay with no water in sight.

The winter of 1852–53 was, therefore, one of great despondency to the *Investigator*, being the third winter in the ice on her own resources, with a crew sickening from short allowance of food and long imprisonment, and with no prospect before them but of abandonment in the spring of 1853, to seek an exit from the frozen seas by sledges and boats; quite unaware that on the opposite side of the channel preparations were already making by two ships to relieve them in the spring.

In the spring of 1853 the *Investigator's* crew were brought to the *Resolute*. Lieut. Pim (late of *Herald*) and Dr. W. Domville led the relief party early in March; and it so happened that on nearing the *Investigator* Pim was in advance alone. The appearance of this solitary helper out of the frozen deep was little short of a miracle to the imprisoned crews. The scene is well described in both Osborn's and

Armstrong's books in the heartfelt words of M'Clure himself. Sledge parties from Captain Kellett's division of the expedition explored the coasts of Melville Island and Pr. Patrick's Island, all round. The sledge parties of the northern division explored the coasts between Wellington channel and the northern part of Jones' Sound, and also the northern coasts of Bathurst Island and Melville Island.

In the autumn of 1853 all four ships of the two divisions were beset in the ice, and so passed the winter of 1853–54. "Kellett's division were in the open pack. Belcher's were jammed on the east side of the Wellington channel—in a cleft stick, as it were—having penetrated into a heavy floe of ice some 10 feet thick. The *Assistance* was making about 22 inches of water in the 24 hours; and that alone would probably have sunk her in a few days after she was left, as she had a large quantity of shingle ballast in her to compensate for the provisions and coal consumed. Unlike the *Resolute* she would not stand upright when light."—R.*

And in the summer of 1854 Sir E. Belcher determined on abandoning all four vessels (five, including the already abandoned *Investigator*) and taking the crews home in the *North Star*. He came to this determination from considering that there was little expectation of the vessels being released from the pack, and that there was no hope now of finding any of Sir John Franklin's party alive, and, therefore, the only remaining consideration was the safety of the *Enterprise*. A notice of that ship had been found at her winter quarters in Walker Bay by Lieutenant Mecham, of the *Resolute*, in 1854; who, in obtaining it, made the longest sledge journey on record, and by his determination earned the gratitude of all concerned in the welfare of the *Enterprise*, it being the first notice of her since 1851. By this it appeared that she had gone east along the North American Coast in 1852. Sir E. Belcher, therefore, considered that by this time the *Enterprise* had either returned to Behring Strait or had been abandoned, and in that case her crew would either seek the Hudson's Bay settlements or the depots known to exist in Prince Regent's inlet. He thought, therefore, that he was sufficiently providing for this contingency by leaving depots at Beechey Island, and Melville Island, and at the north ends of Peel Sound and Prince Regent's Inlet; and taking all these circumstances into consideration he came to the conclusion that he would best meet the intentions of the Admiralty by withdrawing every man from the Arctic seas. His own ill-health probably influenced him more than he was aware of.

His instructions undoubtedly pressed upon him the earnest wish of the Admiralty to close this long search; but they also gave him distinct authority to leave vessels and crews, if he thought the safety of any parties required it. As it turned out, the *Enterprise* had gone back to Behring Strait in 1854, but Sir E. Belcher did not know that. It was an unfortunate issue of the expedition, especially as the remains of the Franklin party were afterwards found in the very region where he himself had advocated a search.

* The notes signed R. are by Admiral Sir G. Richards.

It is a grievous matter at any time for a crew to have to abandon their vessel. A ship, at all times an individuality to the seaman, after a voyage becomes a personal friend, and when some successful expedition has been made in her, is felt to be entitled to share the honours. Every ship in Her Majesty's Navy has a character of its own which adheres to it when and wherever it sails. The order for abandonment naturally, therefore, created a feeling of regret, like that of retreating from a well defended post, even among those who allowed it to be necessary. To the warm-hearted captain of the *Resolute*, was added the distressing thought that he was apparently abandoning his dear friend Collinson, and he did not recover his spirit at home till the news arrived of that friend's safety.

The seven crews left Beechey Island in two vessels (the *Phœnix* arrived just as they were departing) on August 26th, 1854, and notwithstanding all their exploits, returned home unsuccessful like the others. And in that autumn the Arctic regions were once more left to their natural solitude, excepting only the silent figures of four of Her Majesty's ships.

For the *Resolute* herself, penetrated, no doubt, with the lively feelings of her Commander, was not to be left a deserted widow in the frozen ocean. Whether from some magnetic sympathy with him, or from some more natural force, we say not, but apparently about the same time as the crews left Beechey Island, the *Resolute* in her icy bed began to move also, and slowly but securely followed in their track; all through Barrow Strait, through Lancaster Sound, down the west side of Baffin Bay, into Davis Strait, a voyage of 16 months and 12000 miles; and was there found by an American whaler, complete in all respects, though without a living soul aboard. And, finally, having been purchased by the Government of the United States, was restored to Her Royal Mistress, as perfect in every respect as on the day she left England; where she should have been honourably preserved, a living evidence of the possible safety of the pack.—[Ed.]

## SECTION XIII.

### VICTORIA STRAITS.

### SPRING, 1853.

HAVING had occasion to notice the extraordinary oscillations of the needle when making use of the unifilar magnetometer, I determined on leaving one needle suspended during my absence, and obtaining a series of observations on the diurnal changes in the magnetic declination; a new magnetic observatory was built, and the instrument placed under the charge of Mr. Arbuthnot (ice mate), who obtained a number of observations between the 10th of April and the 3rd of May, when the melting of the walls of the observatory compelled him to take his instrument on board.[28]

See Note 28, Appendix: PERSONAL TROUBLES.

Five natives visited us upon the 11th of April, and though the thermometer yet fell as low as −23° at night, I determined no longer to delay our departure, fearing that the ice would break up earlier this season than our last, and thus obstruct our return. Accordingly we left on the morning of the 12th, but before I give an account of our proceedings, I shall carry the journal of transactions on board up to the period of our return, the 31st of May.

The magazine was cleared and restowed, the tanks got up from the main hold, and the coals stowed there removed to our bunkers, when it appeared that we had 21 tons remaining on board; the bread room was cleared and the bread examined, thus completing a thorough overhaul of our provisions, which on my return I was glad to find afforded us an ample supply of everything for an ensuing winter, should occasion require it, with the exception of spirits, which we

could do without. Fuel was the next article we were most in want of, and parties were sent out to cut and dry turf some of which we had used successfully in our Sylvester's stove during the winter. The main deck housing was furled on the 26th.

On the 1st of May the thickness of the ice in the bay had increased to 8 feet 2 inches. The thermometer in the sun on the bulwarks had once risen to 73°, but the nights were still very cold with much hazy weather, the mean temperature of the month of April being 3° below zero, while last year it was 10° above.

Rain occurred on the 19th. On the Queen's birthday an extra allowance of provisions was issued; and the following day the *Enterprise* sleigh, under charge of George Fowler, quartermaster, was dispatched to meet the party returning from the eastward. Towards the close of the month the ship was visited frequently by the natives, who had now evidently returned in considerable numbers to our locality; they had, however, little or nothing to spare, nor could our sportsmen as yet obtain more than an occasional ptarmigan.

## Sledge Expedition to Victoria Strait.[29]

[29] Victoria Strait. — The Victoria Strait, lying between Victoria Land and King William Island, proved eventually to be the central point of interest in the ten years' search for the Franklin expedition. The few and slight traces of the lost ships (subsequent to their wintering at Beechey Island, 1845–46) that were noted in the course of the search, pointed in the direction of those straits. Several of the Arctic officers concerned in the search, and some others, notably Mr. J. Brown, advocated its pursuit mainly in that quarter, but the majority of the experts in those matters were in favour of the north or west direction, on account of the supposed impracticable character of the S.E. channels; and thus those slight indications of the track of the missing ships did not receive the attention they were afterwards found to have deserved.

The first of these traces was in October, 1849, from the whaling ships in Baffin Bay, who had heard from the Esquimos about Ponds Bay, that two ships had been frozen in for four years on the west side of Prince Regent Inlet, and two more frozen in for one year on the east side of it. Such reports among the Esquimos become greatly distorted in character and in date, and it becomes difficult to extract any reasonable residuum of truth from them, especially when their language is not well understood. But from subsequent knowledge it is quite probable that the above report

applied to the two ships of Franklin's expedition, and to the two ships of Sir James Ross's expedition in 1848.

The next trace was in April, 1851; a piece of a small flagstaff with line and copper tacks, having the Government mark, and another piece of a stanchion belonging to a ship, found in Parkes Bay at the S.W. corner of Victoria Strait by Dr. Rae. He considered they came from the north, as the flood tide came from that direction; and that for the same reason there would probably be found a passage from Peel Sound to Victoria Strait by which the missing ships might have attempted to come.

The next was in July, 1853; a part of a frame or door of either a companion hatch, or a temporary observatory, with the Government mark on the copper nails, found on the Finlayson Islands in Dease Strait by Captain Collinson; and which he thought might have come from the missing ships. The flood tide in these straits comes from the eastward.

Two good Arctic authorities, Sir F. W. Beechey and Sir J. Richardson, had recommended examination of this region in January, 1850, believing that there was sea communication between Barrow Strait and Victoria Strait, and that Franklin's ships might have been caught in the ice and carried down one of these channels. In general, the current in Melville Sound sets to the east, and would carry the drift ice down such channels if they existed, to the north end of Victoria Strait, where its further passage would be blocked by the narrowness of the Strait. We now know that this was exactly what happened. Three sea passages have been found between Melville Sound, Barrow Strait, and Victoria Strait; one by M'Clintock Channel, one by Peel Sound, and one by Prince Regent Inlet and Bellot Strait. The *Erebus* and *Terror* were carried down one of these channels and beset in the ice north of Victoria Strait, abandoned there in 1848, and their crews endeavoured to make their way southward to the American Continent; and their remains were found, some by Dr. Rae in 1854, but mainly by Captain M'Clintock in 1859, along the coast of King William Island and the mouth of the Back River.

It was, therefore, unfortunate, as it turned out, that the attention of the searching expeditions was diverted from this part of the area of search; and that both Captain Collinson and Dr. Rae looked doubtfully on the relics they found, although they were nearer the object of their search than any other parties. Indeed, Dr. Rae, without being aware of it, gained the honour of most nearly effecting the north-west passage by sea, by getting his boat within 50 miles of where the *Erebus* and *Terror* were abandoned.

The captain of the *Enterprise*, it is true, was in difficulties in 1853 about fuel, which compelled him to return westward; but had the probability of finding the missing ships in that south-east part of the sea been more felt by the Arctic authorities, he would, no doubt, have gone in that direction earlier. On his voyage home in 1855 he heard at the Cape of Good Hope of Dr. Rae's getting, in 1854, some undoubted relics of the lost expedition from the mouth of the Back River; and

he immediately came to the conclusion that the ships had come by the way imagined by Dr. Richardson, to Victoria Strait. And he says in his journal, that if they (in the *Enterprise*) had possessed the means of understanding the natives in Cambridge Bay (the interpreter of the expedition, Mr. Miertching, had been accidentally left on board the *Investigator*), they would have got a clue from them which would have induced him to pass over to Boothia and examine its western face instead of examining the east coast of Victoria Island. But, although the natives at Cambridge Bay apparently wished them to understand that there were ships to the east of them fast in the ice, and drew a chart to illustrate it with the usual cleverness of the race, as this chart turned out to be incorrect, a doubt was thrown on the whole story, and no further thought given to it.

Thus these two explorers were unconsciously close on the track of the object of search, and both had the ill-luck to go along the west side of Victoria Strait, passing only 30 miles from the spot on the opposite side where there was lying all the time the boat containing the last remaining corpses of the Franklin expedition. It was even a closer chance with the sleighs of the *Enterprise*, for the captain had intended one sledge to go up the other side of the strait, and was only deterred from sending it by the roughness of the ice, which necessitated the presence of both together.

The Victoria Strait has also another element of interest to Arctic friends, in being the most probable line of traffic from east to west in those seas, if such a line should ever be wanted. The captain of the *Enterprise* came to this conclusion after his exploration in 1852–3. It is founded on the fact that the narrow channels are generally more clear of ice in summer than the open sea; and this is caused by the greater force of the tides and currents in those channels. The prevalent currents and winds in the Arctic regions being from west to east, the great massive floes of Polar ice are drifted from the Arctic Ocean through M'Clure Strait and Melville Sound, and down M'Clintock Channel, but are stopped by the narrows of Victoria Strait and Barrow Strait. But the current goes on through Barrow Strait and Bellot Strait to Baffin Bay. Another easterly current comes along Dease Strait; but in the tortuous channels about King William Island these easterly currents are somewhat counteracted by the flood tide, which comes from Baffin Bay through Bellot Strait, and meets the flood tide from Behring Strait about Coronation Gulf. The general effect of this meeting of tides and currents, and checking of the massive ice floes, is, that the narrow channels in that S.E. region have only new, or one year ice, in them, which is usually cleared away in summer. It has been said that if Sir John Franklin's ships had chanced to get into James Ross Strait (E. of King William Island) they would have come through by Simpson Strait, and Dease Strait to Behring Strait.—[Ed.]

The outfit of our sleighs remained nearly the same as last year, with the exception that we had got a new one made on

board, which was named the *Royal Albert;* and having sacrificed one of our large ice saws in order to make runners (as the *Resolution* being shod with iron hoops was found to run heavy), we had the satisfaction of finding she answered very well, although not equal to the two fitted at Woolwich. The question of our fuel, as we could not look forward to picking up any drift wood on this occasion, had caused us much anxiety; but after many trials under the gunner's mate, we managed to compose some fire balls, which, with the thermometer at —30°, thawed and boiled 8 pints of water in half an hour, the material only weighing $\frac{3}{4}$ of a pound. After a good trial in laying out our depots, we found that 3 lbs. weight of this composition, with the assistance of one stave of a cask, sufficed to cook the two meals each day for 8 men. The following are the articles and the proportion we found best suited to our purpose :—

| | | |
|---|---|---|
| Junk . . . | 70 lbs. | To make 100 lbs. |
| Oil . . . . | 6 gall. | |
| Saltpetre . . | 1¾ lbs. | |
| Rosin . . . | 3 lbs. | |

The rosin and saltpetre were dissolved in boiled oil, the junk cut into 6-inch lengths and well soaked, being dipped twice after they are cold, and then rolled up in old wrappers or bread bags. We found less would do as the weather grew warmer; and the only inconvenience was that it required more attention from the cook; and that the smoke and soot, as we could seldom afford water for washing more than once a week, dirtied our blanket bags. A slight alteration was made in the scale of victualling; the following being the allowance determined on to each sleigh per day: Bread, 8 lbs.; pork, 4 lbs.; pemmican, 4 lbs.; preserved potato, 4 lbs.; rum, 2 pts.; tea, 4 ozs.; sugar, 1 lb.

*Provisions for one Sleigh for forty days.**

Bread, 320 lbs.; pork, 160 lbs.; pemmican, 160 lbs.; potatoes, 10 lbs.; rum, 12 pints; tea, 40 lbs.; sugar, 160 lbs.;

* This calculation appears to take into account the depots, as it does not agree with the daily allowance.

dogs' meat, 160 lbs.; fuel, 160 lbs.; 3 kettles; 1 stove; 3 muskets; which, with the tent, floor-cloth, racoon skin, buffalo robes, 5 boarding spikes, 8 blanket bags, axe and saw, men's clothes and ammunition, including the packages they were stowed in, amounted to nearly 17 cwt.; but as a considerable quantity had been already deposited in advance, I calculated that our heaviest load would be 15½ cwt. In consequence of illness a slight change took place in the crews, and they were manned and commanded on this occasion as follows:—

| *Enterprise.* | *Victoria.* | *Royal Albert.* |
|---|---|---|
| Capt. Collinson. | Lieut. Jago. | Geo. Fowler, Quarter-master. |
| Hy. Hester, Capt. Coxwain. | Jas. Rich, B. mate. | Wm. Smith, A.B. |
| Wm. Gowan, A.B. | Rd. Thomas, ship's cook. | Wm. Wilson, A.B. |
| Wm. Murray, A.B. | Thos. Cousins, Capt. M. T. | Hy. Sergeant, A.B. |
| Wm. French, A.B. | A. Ball, A.B. | Wm. Scott, Officers' cook. |
| Jno. Chartres, A.B. | Jos. Wiggins, A.B. | Chas. Elmore, A.B. |
| Geo. Wenman, A.B. | Geo. Deverell, M. | Chas. Carrol, A.B. |
| Wm. Marshall, A.B. | Wm. Jefferson, A.B. | Jas. Mayhew, M. |

*Dogs.*

| | | |
|---|---|---|
| Sandy. | Fagan. | Cribbage. |
| Daddy. | Bill. | Hook. |
| Bevis. | Jacka. | Hatchett. |

*Journal while absent on the E. Coast of Victoria with the Enterprise, Victoria, and Royal Albert Sleighs.*

*April 12th.*—At 7.40 a.m. we left the ship and got on to the land at 10.15, whence we had fair travelling, and camped 1 mile south of the Pilot knob at 5.

*April 13th.*—Started at 7.40 a.m. The sun being obscured, mistook our route and kept at first too much to the eastward, reached Long Lake at 10, then had good travelling over it; but in the afternoon came on stony ground, and did not reach the salt water at Rae Inlet until 4.15. Camped at the first depot at 5.

*April 14th.*—Started at 7.30 a.m. Rae Inlet runs N. and S. 2½ miles; the islet is nearest to the W. shore, the

channel between us and it being under a mile. The coast line outside the inlet trends immediately to the E. Got the meridian altitude and true bearing at noon; passed over last year's deer tracks; road good; camped at 5. Got the dip of the needle.

*April 15th.*—Started at 7.30 along a low coast ill defined; at noon abreast of a bight; ice packed all the way in shore of us; crossed an old fox track or two; camped at 5 about 3 miles from the shore. Parhelion at sun-down. Two of the *Victoria's* snow blind.

*April 16th.*—Started at 7.45. Came upon the junction of two floes at 10 and again at 1; heavy pressure here. Camped at 5.15

*April 17th.*—Started at 7.30 over good travelling ground; passed old bear tracks; came to the Wyvil depot at 11. *Royal Albert* left 5 days' provision; picked up the remainder and proceeded at 12.30; hauled out of bight at 3.30; ice becoming packed; low land to the E.S.E. connection not visible; camped at 5.15 close to the barrier, which appeared to extend all the way to the shore, and was impracticable with our heavy loads.

*April 18th.*—Started at 7.30, making an E.S.E. course; got the meridian altitude; in the afternoon among rubbly ice; hauled out S. by E. and camped at 5. Land apparently connected from S. by E. to E.N.E.

*April 19th.*—Started at 7.30. Road better, but only able to make a S. by E. course. In the afternoon hauled to the S.E., and latterly E.S.E.; bear tracks seen; camped at 5.

*April 20th.*—Started at 7.30, steering E.; low cliffs to the N. four or five miles distant; got the meridian altitude and true bearing at noon. P.M. course E.N.E.; crossed a heavy barrier at 4.30, bear and wolf tracks about it; land now trends to the N.E.; camped at 5.10.

*April 21st.*—Started at 7.30. Course N. by E.; road good; got meridian altitude and true bearing. Came in to the shore at 3 and camped at 3.45. Deposited bread, 80 lbs.; potatoes, 40 lbs.; pork, 41 lbs.; rum, 3 gallons 3 gills; tea, 3 lbs.; sugar, 10 lbs.; fuel, 2 packages; dogs' meat,

18 lbs. Received 5 days' provision for the *Enterprise* and *Victoria* from the *Royal Albert*, the latter receiving orders to return to the ship and meet me 5 days' journey to the eastward on the 31st of May. Exchanged Chartres for Elmore, the former having a sprain.

*April 22nd.*—Started at 7.30, *Royal Albert's* crew helping us through the rubbly ice; 8, they returned; 9, broke one of the *Enterprise's* runners, sent Murray after the *Royal Albert*, fished the runner, and sent the empty sleigh to be exchanged. Noon, Hester returned with the *Royal Albert*, loaded her and proceeded at 1.10. Course N. by E.; crossed bear tracks. Ice much shattered, but travelling good on the whole. Low land one mile to the west; passed a cliff at 4.30, the land thence trending apparently more to the westward.

*April 23rd.*—Started at 7.30, travelling good; occasional barriers requiring the crews of both sledges to get one over. Crossed bear tracks; came up to the junction of the new and old ice at 2.30; camped and sent out four parties, who returned in the evening, reporting the ice impracticable for sleighs from E. to W. by N., forming a similar barrier to our progress as was experienced last year by the *Resolution*, between Banks Land and Melville Island. Here there was scarcely such a thing as a level spot to be seen, but a most confused jumble of angular pieces, many of which were upwards of 20 feet high, while the snow between them laid so loose that we frequently sank up to the middle, and only extricated ourselves by our hands.

*April 24th.*—Started at 7.30, making a S.W. by S. course. Murray sick; 12, unloaded the sleighs and carried half the cargo at a time across a barrier a cable's length wide. Struck in for the shore and came upon rubbly ice at 3; took half the load off and got to the beach at 3.30; returned for the remainder, and camped at 4.30.

*April 25th.*—Started at 7.30; came upon a low shingle point at 9.30; camped, weather being too severe to proceed.

*April 26th.*—Detained in camp all day by bad weather.

*April 27th.*—A ptarmigan seen. Started at 7.45; very cold, travelling pretty good; occasionally obliged to employ

both crews to one sleigh. At 1 came across the barrier and struck in again for the shore, made a W.S.W. course, passed a bear track, reached the shore at 3, and camped at 4.45.

*April 28th.*—Detained in camp by bad weather.

*April 29th.*—Started at 7.30. Course W. along shore; 9, came to a point, on which were five *caches*, circles of stones showing summer encampment, and a small piece of drift wood; land trending to the S.W.; struck off through the barrier to the N.W.; noon, going N., ground smoother; 1.30, saw the land to the N.E.; 4.30, crossed a barrier; 5.15, camped; several bear tracks.

*April 30th.*—At 4, Jefferson saw a bear within a quarter of a mile of the tents, which the dogs started after and drove off; they all returned with the exception of Daddy, and we left our encampment with a heavy heart at 7.30; road not good, rough ice, got the meridian altitude and true bearing; 1.30, came upon a low point on which large stones were pressed up by the ice, much old ice off it; camped opposite the centre of a bay at 5, near to a large piece of ice; at 10 p.m., greatly to our joy, Daddy came back.

*May 1st.*—Started at 7.30; came upon a cliff point at 11.10. Left 32 lbs. of pork, 32 lbs. of pemmican, 64 lbs. of bread, 32 lbs. of potatoes, 2 lbs. of tea, 8 lbs. of sugar, rum 3 gallons 2 pints, 4 packages of fuel, 8 tins of dogs' meat; got the meridian altitude. Passed another point at 2; ice pressed much up on the shore from here; camped at 5.

*May 2nd.*—Started at 7.30; made a N. course along a low coast until noon, then N.N.W.; much rubbly ice; picked up a small piece of drift wood and an egg shell.

*May 3rd.*—Started at 7.45, over better ground; 10.30, on a low islet, no other land visible; noon, a point E., hauled out for it; 3.30, came upon rough ice; camped at 5.

*May 4th.*—Started at 7.40; 8, saw the point bearing S.E.; passed over it at 9; picked up 4 pieces of drift wood, one of which was 3 feet 6 inches long, and part of a stump 8 inches in diameter; course now E.N.E.; came under a bluff 150 feet high, at 11; travelling fair but weather very hazy, objects often not visible at two cables length; eyes bad.

*May 5th.*—Started at 7.30; course N. by E. and N.N.W., along a low shore, travelling pretty good; at 2, coast line trending N.N.W.; left a depot of four days' provisions, and struck through the barrier, making a N. course; ice much broken up, travelling bad; camped at 5.30. Land from N. by E. to N.W., then a gap of 3 points, and continuous to depot point.

*May 6th.*—Started at 7.30, steering N.N.W. over bad ground; 10, came upon a smooth surface; bear tracks very numerous, saw one; Lt. Jago, Marshall, and Rich went after it without success. A low point, N.E. by E.; 1.30, came up to it and found a cairn apparently not long built, coast trending E.N.E. and N.E., scarcely elevated above the sea; 3, saw two more cairns, one near the beach, the other a mile inland; found nothing in their vicinity to indicate by whom they were built; land very low, no soil, fragments of yellow limestone and rounded boulders of granite. A few birds' nests of seaweed and moss; camped at 5.30; got the magnetic dip and force.

*May 7th.*—Started at 7.15, coast trending N. by E., very low; crossed fox tracks. A warm day; camped on a point at 5.15.

*May 8th.*—Started at 7.30, along a low shore; left the beach at 9.30; came in sight of a beacon at 10.30, bearing N.N.W.; got to it at 1.30, and found a paper containing the following notice: "A party of 10 men and 2 officers of the Hudson's Bay Company descended the Coppermine river in the latter end of June, in two boats. Found a channel of open water along shore on the 5th of July. Came along the coast eastward as far as Cape Alexander; were detained there some days as the ice in the strait was still unbroken. Then crossed over by the Finlayson islands to Victoria land, which was found to run nearly E. to long. 102° 40′, when it turned up to the north. There is a deep and irregular shaped bay between lat. 69° 15′ and 69° 40′ N. in long. 102° 3′. The boats were arrested by ice in lat. 69° 43′ and 101° 24′ (?) W. long. A walking party traced the coast 35 miles further nearly due N. The only particular

worthy of notice was an island seen about 5 miles long, and 4 miles from the shore. Much of the ice was still unbroken and was pressed close to the shore by a continuance of north-easterly winds, which will probably make our return difficult. As far as regards the object of the expedition, a search for Sir John Franklin and party, we were quite unsuccessful.

"JOHN RAE. Chief Factor. H. B. Co.,
"Commanding the Expedition.

"Lat. 70° 2′ 30″ N., long. 101° 18′ (?) W.
"13th August, 1851.

"NOTE.—To-morrow I return to the boats.

"J. R."

Thus we became acquainted that our field of researeh had been examined; but having eight days' provisions left we set off with the hope of extending the exploration seventy miles further, and camped at 5.15.

*May 9th.*—Left at 7.30, making a N. course along a low shore; at 10.30 it trended W.N.W., and seeing a point or island bearing N.E. by N. we struck off for it, but coming upon very bad ground at 1.30, the water showing near the heavy pieces, and the snow being very loose, we made but little progress, and camped at 5, after a hard day's labour.

*Furthest North.—May 10th.*—Murray shot a ptarmigan. Started at 7.30, and after some labour, but not so difficult a road as yesterday afternoon, we came upon the land at 9.15. A small islet one mile to the W. of where we landed. Making a *cachè* of 4 days' provisions, we kept N.N.E., N., N.W., and W., until 2.30 p.m., when on ascending a hill it became evident that we were upon an island, with no land in sight, except in the direction we had come from. The appearance of the pack to the N.E., N., and N.W. forbid all hope of penetrating even with our light load through it; so building a cairn, which our observations eventually placed in lat. 70° 26′ N. and long. 100° 47′ W., and depositing information, we retraced our steps to the south-eastward, camping on the land at 5.15 and obtaining the magnetic dip and force.[30]

See Note 30, Appendix: POLAR ICE.

*Return Journey.—May 11th.*—Started at 7.30, steering E.S.E., then S.S.E.; came to the depot at 10, and kept a westerly course until noon, by which we avoided in some measure the difficult road we came by, being to the W. of it about two miles. In the afternoon we were enabled to keep W.S.W., and latterly, S.W. by W.; travelling bad in several instances, and pools of water about the large masses of ice; camped at 5.

*May 12th.*—Started at 7.30; came to the shore at 9; and leaving four days' provision at a large boulder of granite (9 feet cube), we then made a W. by S. course along a low coast; at 12.30 we came upon a point which was a little more elevated above the sea, the highest part of it being 60 feet; from here the coast trended to the S. of W., but seeing land bearing W.N.W. we struck off in that direction and came upon a low spit at 2, inside of which old ice was heavily packed. At 2.30 we got a sight of a bear, and loosing our dogs, they brought him to bay, and he was soon dispatched, proving a male of the first year, but in very poor condition, having scarcely any fat on him at all. We camped at 3 in order to flay him while warm.

*May 13th.*—Our provisions being exhausted, I remained in camp in order to obtain the dip and force, and observations necessary to determine our position. Lieut. Jago left with two men towards the W.N.W., while Hester with another was sent to trace the mainland to the S.W.; both parties to erect marks. They both returned in the forenoon, the land proving nearer than we imagined. The land Mr. Jago reached proved to be an island, with another beyond it, and the appearance of land to the W.N.W. Hester reached a cliff-head, whence the land continued its south-westerly trend, the sea between him and the island visited by Mr. Jago being closely packed with heavy hummocks of ice. The day being misty prevented their seeing far. Our tent proved to be in 70° 12′ N., and longitude 101° 40′.

*May 14th.*—Having determined on travelling by night on our return, we set off at 8.10 p.m., and got to the depot at 12.20, whence we struck across the low land in a S.S.E.

direction, and came to the sea-ice at 4.30, camping at 5.30 a.m. Leaving at 7.30 p.m., and steering a S.S.E. course, we reached Rae's beacon at 10.15, and left a cylinder, and after a S.E. by E. course, reached the south shore of the bay at 1 a.m., May 15th, along which we proceeded until 5 a.m., making a S. course. Before starting, observations for our position, the dip and force were obtained; camp broke up at 8; travelling S. by W. over good ground.

*May 16th.*—4.15 a.m., reached the northernmost beacon of the three (all of which we pulled down in our search for papers and never rebuilt), and then struck across the low land, finding the travelling not so good on the shore as on the beach. Camped at 5.15.

Got forenoon and afternoon sights for time; started at 7.30 p.m., making a S.W. course; left the shore at 9.45, came upon rough ice at 10.30, and got to the south shore at 2 a.m., May 17th. Keeping a S.E. course along it, we came upon a long point, with a deep bight to the west of it, full of old ice, at 4.30, and reached our third depot at 5.20, the land trending now S.S.E., and the bay full of reefs. Got observations for position, dip, force, and variation. Left at 7.30 along a low coast with salt lagunes, in which now and then were pieces of old ice. Boulders have more quartz in them than to the northward, the limestone is darker, and porphyry in small rolled knobs begin to be abundant. Came to a bluff at 1.30 a.m., May 18th; another at 3.30. Crossed the land and camped at 5 on a salt water lagune, in which were pieces of old ice 8 ft. above the frozen level. During the last hour we found, on the sun coming out afterwards, that we had been making a N.W. course; so difficult is it to maintain a true direction unless guided either by the coast or the land.

Leaving at 7.30 p.m. and making a S.W. by W. course, we crossed our up-track at 9.15, and left the low islet two miles to the west at 11. Rubbly ice after midnight; got to the shore and camped at 5 a.m., May 19th. Too much wind for magnetic observations. Started at 7.30 p.m., steering E.S.E. along a low coast, strewn with large blocks of limestone,

which the ice had forced up, but which had not travelled far; came upon our track at 9.15, and kept south, a low cliff at 11, and a point with a pile at the back of it at 1 a.m.; reached No. 2 depot at 3 a.m., May 20th; found *Victoria's* packing case broken open by a bear, who had helped himself to the pork and sugar, and destroyed the bread and potatoes; fortunately our provisions were in a cask, which bore the mark of his claws, and a 32-lb. pemmican tin escaped his notice. He had, however, extracted the bung from a beaker of spirits and capsized it; being concentrated and intended as a reserve supply of fuel, this might have proved a serious loss had not our fireballs done their duty. After picking up the fragments we set out again, and found he had followed up our trail for several miles. We camped at 5 a.m. Leaving at 7.30 p.m., we came among rough ice at 9.15, and got to drift-wood point at 10; then leaving the shore and keeping S. and S.S.W., we came upon bad ground at midnight, and had to haul out to the west. Camped at 5 a.m., May 21st.

Started at 8 p.m., making a S.S.W. course; 9.30, came in with the shore barrier, and had some difficulty in getting through it; crossed our track at 10.30, and came to Bluff Point at 3 a.m., whence we got sight of No. 1 depot, much to my satisfaction, as I had some fear, being so far to the south, the Esquimaux might have disturbed it, which, after Bruin's depredations, would have put us upon short commons. We reached it at 6.15 a.m., May 22nd, and having now secured provision to carry us back, passed a quiet Sunday with thankfulness.

After obtaining the dip and force, and building a cairn, we left at 1 a.m., May 23rd, across the land, making a W.S.W. course; camped at 5 a.m., having come over a very bad country.

Started at 7.30 p.m., steering as well as we could judge, the sun being obscured, W.S.W.; came to the sea at 10, and passed through rough ice; camped at 5 a.m., May 24th. When the sun came out found we had been making a S. course; got afternoon sights, and saw the land we had left

bearing from N.W. to N.N.E.; 7.30 p.m. started, making a westerly course; 10.30, sun obscured, course uncertain; 12 midnight, got sight of the land to the north, saw three deer; 3 a.m., May 25th, *Victoria* broke a runner; fished it, and camped at 5 a.m. Started at 7.30 p.m., but, being unable to tell in what direction we were going, camped at 9.

The sun showing at 7 a.m., May 26th, we loaded the sleighs at 7.10, and proceeded until 11.30 a.m., making a N.W. course; moved again at 8 p.m.; 9.30 saw the land, kept N.N.W. until 10, then N.W.; crossed a crack at 4.30 a.m., and camped at 5.30 a.m., May 27th. Several recent deer tracks. Started at 7.30 p.m.; came upon our track at 9.40; crossed a crack a foot wide at 10, another at 11.30, and another at 1; got sight of tent at 2.30 a.m., came up to it and camped beside it at 4.20 a.m., May 28th.

From Fowler we learnt that all was going on well on board and that the natives had returned in considerable numbers; but they brought no fresh food for barter, nor had our sportsmen been successful, although several deer had been seen. Although only two days' good journey from the ship, as we had abundance of provision, I determined on dividing it into three. We did not accordingly break up our encampment until an hour later than usual; crossing a crack at 1, we came to the entrance of Rae Inlet at 1.30, and camped in the ravine at the head of it at 3.15 a.m., May 29th. Several deer tracks were seen, and the trail of an Esquimaux sledge, which had been brought down apparently for the purpose of carrying away a small cask of coals we had placed in the head of the inlet as reserve fuel; the salt water showing under the cliffs. This ravine is a narrow gorge, with precipitous limestone cliffs on each side. The salt water runs nearly a mile up it, and if there is depth of water at the entrance, would form a good place for winter quarters. Whether or no, Rae Inlet is the most eligible spot for the purpose I have seen in this vicinity. The limestone appeared here *in situ*, being the third spot only in which I have met with it; the two others being Mount Pelly, and in the Straits in lat. 69° 15′ N., and long. 101° 40′ W.; otherwise the whole

coast may be said to consist of small angular fragments, with rounded stones of granite, greenstone, and porphyry. Here also the vegetation appears more luxuriant than in the neighbourhood of the ship, and somewhat approached our last winter quarters.

Leaving at 8 p.m., we proceeded through the ravine in a N.N.W. direction, and found easy egress at the upper end, where numerous stones with turf upon them showed the Esquimaux were in the habit of using it as a natural corral for the deer. At 10.45 we came upon Long Lake, and got sight of Mount Pelly at 11.40. Leaving Long Lake at 1 a.m., we struck across the land in a W. by N. direction, and camped at 3.50 a.m., May 30th, to the W.N.W. of the Pilot knob. A solitary deer came and looked at us, but the ground being destitute of cover, it was of no avail to follow him. Not wishing to arrive in the middle of the night, we did not strike our camp until 11.40; and got sight of the ship at 1 a.m., when we found we were steering two points to the north of our course, and eventually got on board at 6.10 a.m., May 31st, all our party being hale, although many of us were much fagged.

## On Board the Ship.

During the first week in June the natives were frequently on board, and a small party (three tents) were camped on the N. shore of the inlet. On the evening of the 5th Lieutenant Phayre left with a sleigh for the American continent; taking the Finlayson Islands in his way, he traversed the coast-line from Cape Alexander to the eastward, depositing information relative to the *cache* on Simpson Rock, and painting the ship's name on the rocks. On arriving at Cape Trap on the 9th, he sent one man across to the ship for ammunition; and representing that his present locality was a good one for shooting, a sleigh was despatched to him the following day with six days' provisions; the latter returned on the morning of the 12th June with five hares and four ptarmigan. A shooting tent was also pitched in the neighbourhood of Mount Pelly; but

the birds were yet scarce, and the deer too shy. We obtained, however, sufficient to put our sick on fresh diet on salt meat days, which, as the scurvy had begun to show itself, was of great importance.

Strange to say, that four out of five attacked by this scourge[26] were of the party who had been absent with me;

See Note 26, Appendix: HEALTH.

which surprised me very much, as our allowance of food was as much as the people could consume, consisting of half a pound of pemmican of the best description, half a pound of pork, which previous to boiling had been well steeped, half a pound of potatoes, and one pound of biscuit: no lack either of fresh air or exercise. I imagined we must be exempt; but I found immediately on my return, that the black marks (together with pains in the joints), which had shown themselves slightly on my person at the commencement of last winter, had again made their appearance; by, however, taking my established allowance of limejuice regularly, they disappeared in the course of a week. Neither on this or the former occasion had we taken limejuice with us, trusting that our guns would provide us with a fresh meal in lieu. In this expedition, however, we obtained little or nothing, and the hard work, together with its being the second year, brought the disease out: it yielded almost immediately to the surgeon's remedies, none being afflicted beyond a fortnight. The natives continued to visit us, 28 coming on board on the 12th June; during the week they brought a few rock cod. The tent was accordingly moved from Mount Pelly to the neighbourhood of their camp, in order to combine fishing and shooting. The ducks were now brought in in considerable quantities, and we were enabled to issue a portion to the crew daily until the 19th June, when, on Mr. Phayre's return, our larder afforded a general issue for Sunday.

Our *kayak*, which had been purchased in Port Clarence, had always excited great admiration among the natives; and I had told one of them that he should have it for five deer.

This week, however, they brought another alongside, and I at first thought they had misunderstood me. It fortunately afterwards struck me that they wished to exchange, which I was glad to do, in order to get a specimen of their work, where wood is so scarce: both were calculated to hold only one man; but ours was much larger, weighing 60 lbs., while theirs only weighed 26. In shape, too, they were somewhat different; ours, however, was slightly damaged; I therefore threw in an ash paddle, made of a broken oar, which sent them away highly pleased with the exchange.

A small tarn being open in our neighbourhood, we commenced watering, as I was anxious to get the ship as deep as possible before the ice broke up, and drove her towards the reef. Our tide-pole hole became choked with ice, and in trying to clear it the pole unfortunately was broken, which I much regretted, being desirous of continuing the register in the same spot until the ice broke up: another hole was made, and a pole fitted, in hopes of being able to compare the two registers hereafter.

Lieutenant Jago was this week sent out towards Cape Colborne; and what with the game he sent in, and that obtained by the surgeon and assistant-surgeon, together with others in the vicinity of the ship, we had three general issues of game during the week; a small quantity of fish was also obtained, but it did not prove very good, or in sufficient abundance, to repay the trouble.

On one occasion, the natives were induced to show their skill by shooting at the mast-head vane from before the windlass. I did not see the practice, but was told it was extremely good, the vane being hit three or four times although it was unsteady.

Towards the close of the month the survey of the Warrant Officers' stores was taken in hand.

On the 29th June, between 7 and 8 p.m., a most melancholy case of sudden death occurred to William Cheeseman (Private R.M.), who, having occasion to come on deck, dropped suddenly down; and although the surgeon happened to be on deck at the time and thus rendered immediate

assistance, life proved to be extinct. On examination, the cause was found to be an enlargement of the heart, which thus without warning cut off a man apparently in prime health, and who by his conduct and behaviour had rendered himself unusually esteemed.

It had been my intention to visit the Finlayson Islands again, both for the purpose of extending my triangulation, and also to see the state of the ice. Bad weather had prevented my departure on Monday. This night proving fine, and the melancholy event which had just occurred having banished sleep, we set out at midnight; but, instead of going to the Finlayson Islands, I determined as the week was so far advanced, to examine the inlet between us and Mount Pelly, and then trace the coast-line towards Cape Colborne. Crossing over the narrow neck of land ahead of the ship, we camped at 4 at the entrance to the west arm, and then setting out for a hill in the interior I got a sufficient number of stations to determine its coast-line and extent. We also got sight of the large lake in the neighbourhood of Mount Pelly, where some of our people had seen the Huskis fishing: returning to the camp at 10 a.m., we remained until the evening, and then moved easterly towards the entrance, obtaining data for the north arm and coast-line. On the 1st of July I got materials for plotting the coast southerly, and succeeded in reaching the S.W. point of Cambridge Bay, when unfortunately a thick fog came on, which prevented my obtaining all I wished. We got back to the tent at 11 p.m. much fagged, having been greatly harassed in our route by open lakes and running streams, not fordable in our sea boots. We stumbled on two eider ducks' nests with nine eggs, that proved a good addition to our breakfast. On the 2nd of July I sent the sleigh on board; and walking to the south 4 miles on the sea ice, picked up two stations, which I thought would indemnify me for last night's disappointment, and eventually got on board at 3.30 p.m. On Sunday afternoon the body of our late shipmate was interred, a spot being selected not likely to attract the

attention of the natives, and an inscription placed on a stone near it.

Three natives visited us this evening, bringing a small quantity of salmon.

THE FINLAYSON ISLANDS.—RELIC OF FRANKLIN EXPEDITION.

It was my intention to have left on Monday for the Finlayson Islands; but being detained by the weather, I did not get away until Tuesday at midnight. A party with the punt and seine were sent out to a lake about 4 miles from the ship, which I thought likely to afford sport. We had scarcely got an hour's journey from the ship when a thick fog came on; I tried to keep the sleigh in the right direction by a man half a cable's length astern, while I was the same distance ahead, but did not succeed; for after a five hours' walk we found ourselves over on the north shore; when, the fog still continuing, I camped on a low sandy point, which we had some difficulty in reaching, the coast water having made. The fog cleared off about midday, and we moved at 1 p.m., reaching our destination at 6, having to wade the greater portion of the way through pools of water, 2 feet deep in some places. The evening being fine, I at once obtained a round of angles, and the snow being nearly all melted, I had a good opportunity of seeing how the volcanic action had raised a ridge, which apparently stretches from the continent at Cape Trap, through these islands, to Victoria Land.

Between us and Cape Trap were two small reefs, which had escaped Simpson's observation; they are nearly level with the water's edge, and lead me to be very thankful that I did not attempt this channel in the dark nights of last September. The summit of the large island is about 200 feet above the sea, the greater portion of it being nearly of the same elevation; and on the summit were numerous water-worn stones, limestone principally. The sides descended, as usual with basalt, very abruptly; and the numerous stones stuck up to represent men showed that it is a favourite position for the

Esquimaux during the autumn migration of the deer. Very few birds were seen on the islands; but my coxswain managed to collect above 50 gulls' eggs, which unfortunately for us were not in a fit state for the frying-pan.

Another of the crew picked up at high-water mark, on the east side of the island, a piece of wood, which being almost the only article we have met with which could have belonged to the missing ships, demands a description; other pieces of drift-wood were picked up at the same time; I do not think, therefore, that it was brought there by the natives, more especially as it is better suited for making arrows than the drift-wood we have seen in this neighbourhood, and they would not have left the copper hasp, screws, and nails in it; moreover, they have no means of getting to the Finlayson Islands until the sea is frozen over, at which period sufficient snow has fallen to cover all sea wrack. It is composed of two pieces of fir nailed together, the largest piece being 51 inches long by $3\frac{3}{4}$ in its broadest part, and $\frac{3}{4}$ of an inch thick; both ends are broken and worn, apparently by being washed against the rocks. The back has been painted lead colour, and then black; and 13 inches from one end is a copper hasp for securing the latch of a door, fastened on by three screws, and with the Queen's mark ↑ on it; the edge next the hasp has been painted, while the irregularity of the other shows it has been split from a broader piece. On the inside, 3 inches from the end, is a batten, 24 inches long, $2\frac{1}{2}$ wide, $\frac{3}{4}$ thick, chamfered at both ends, secured to the larger piece by copper nails, but with the marks of one or two iron ones; the batten is painted white, as is part of the lower side of the larger piece, which has originally had a coat of light green. I cannot think that it formed part of any fittings to a boat, but is either part of a companion hatch or the lintel post to an observatory. It may have formed part of the stock of fuel which Dr. Rae had with him; but then I cannot account for the broad arrow appearing upon it; if it has not been left there by him, it must have been thrown up by the sea since, as it could scarcely have escaped his observation.

With this relic we set off at 4 a.m. and reached the Sandy Point at 9; when I connected my triangulation from the neighbouring hills. Leaving at 7 p.m., we set out on our return to the ship; finding however, the haulover, from the bottom of the bay to the sea, to be narrow and practicable to our sleigh, I determined on visiting the large lake to the west of Mount Pelly; and crossing to the inlet we camped at midnight at the entrance to the north arm; getting in our route soundings in all the cracks, which proved the fiord to have depth of water sufficient for any ship up to its head.

At 9 the next morning I set out for the lake, but found our course much impeded by numerous tarns and marshy ground. I succeeded, however, in getting a commanding view of it, being by far the largest sheet of fresh water we have yet seen, with numerous islets in it. Ice still covered almost the whole of it, which I estimated at 8 or 10 leagues in circumference. I did not see any Esquimaux tents, but their marks and *caches* were very numerous, and its shores no doubt are the residence of the tribe during the summer. Two streams of considerable size carry the superfluous water into the north arm of the inlet, the larger of which we could not, and the smaller we had some difficulty in crossing; on finding where they debouched, and seeing it a likely place for fish, we transported the sanpan and seine across from the lake, where they were waiting the thawing of the ice, and got a cast in a pool 50 fathoms across by 100 long; being only 13 in number we had some difficulty in getting the seine on shore, but were rewarded for our labour by a draught of 1237 fish, averaging 4 lbs. each. It was, however, midnight before we had secured our prize, and got a sleigh load down to the tent, when making a hearty salmon supper, we all retired, well pleased with our evening's sport.

At 6 a.m. I sent the sleigh with the dogs and two men, carrying a light load of fish to the ship for present consumption, and to obtain more assistance. Fortunately they fell in with a fishing party on their road, by whose aid we got all on board by 5 p.m., when I issued the take in lieu of three days' salt meat.

On the 13th of July we completed our water and got the flagstaff off from the hill, the communication with the shore becoming daily more difficult, as the coast water began to make. The ice, however, about the ship remained firm, and proved 5 feet 2 inches thick on the 15th.

A fishing party was sent out again on Thursday, returning the following day with 330 fish, part of which was salted down for sea store.

## SECTION XIV.

### RETURN WESTWARD.

### SUMMER 1853.

ON the 18th of July we bent sails, and the land water in the head of the bay affording a channel deep enough for boats, the third whaler was put into it to assist the fishing parties going to and fro. Five natives visited us on the 19th, bringing with them a little venison, which, however, our abundance of fish rendered less welcome than it otherwise would have been.

On the 25th of July the ice began to move, compelling us to take up the tide pole, and we commenced cutting a canal astern and unshipped the rudder; the ship was hove half her length astern the next day, and her head turned to the westward. The field, however, making a sudden move in the middle watch, parted our stream cable; by sawing and blasting with gunpowder we got hold of the buoy, and picked up the bower anchor in time to avail ourselves of an opening in the ice, which enabled me to place the ship further from the shoal. She was made fast to the edge of the west ice, about midway between Simpson Rock and Flagstaff Island; the crack which we thus availed ourselves of was rather more than the ship's length wide, and extended nearly to the rock. Here, although less under the protection of the land, we were removed from the immediate danger of being carried by the ice on the reef; and in the event of the ice moving, I hoped by reserving my anchors until the ice butted on the shore, to ride it out without much strain.[31]

See Note 31, Appendix: BREAKING UP OF ICE.

On the 28th a considerable quantity of open water was

seen in the direction of the Finlayson Islands. We attempted in the boats to pick up our stream anchor and hempen cable, which had been laid out in the autumn to heave the ship off by, but being still frozen up in the sludge, we did not succeed until the 30th.

On the 29th of July the ice around us was continually in motion; thick hazy weather prevented our seeing the land; and as by the lead we were drifting towards Simpson Rock, I came to an anchor in 9½ fathoms; by veering small quantities of cable at a time, we rode without much pressure; but the ice, although very rotten, was impervious to our chain cables. There being rather more water now under the island, we moved the ship in that direction on the 31st, in hopes of getting within the reef. Before, however, we reached it, the ice closed, leaving only 2 fathoms water between it and the shore; we came to, therefore, about a cable's length from the spot where we had passed the winter. The movement of the ice compelled us to veer cable on the 1st, and we drove into 3¾ fathoms; on shifting our berth when the ice slackened on the following day, we found our anchor stock broken, most likely by dragging over stony ground. The ice compelled us again the next day to veer, but left us in comparatively open water in the evening; of which I availed myself the following day to examine the bay (as we found several knolls with 3 fathoms only over them), and to find a way into the inner harbour, or to a better protected spot inside the reef, as soon as the ice would admit our getting round it. In the evening a large floe a mile across came into the bay, which I hoped would butt on Simpson Rock and the Flagstaff Island before it reached us; however, it swept clear of both, and we had to bear the whole strain for three and a half hours, when it slewed and went past us, after veering to 168 fathoms. It appeared so eaten into holes that I made sure our cables would cut through it, which they did at the edge, until we were fairly embedded, and then we had to sustain the whole weight.

On the 5th of August I gladly availed myself of there being sufficient open water to clear the shoal, and we warped into

a comparatively secure berth three-quarters of a mile to the north of it; on lifting our anchor we found another stock broken, which occasioned me some uneasiness, as our stock of hard wood was nearly exhausted; having, however, three broken iron ones we managed to fish them together, and produced a very good substitute.

Latterly our fishing place had not proved so productive, although we continued to send whenever the ice admitted, and besides obtaining as much as was required for present use, we had salted and dried 1200; now we tried the bays around us, but only succeeded in taking a few. Four natives visited us, bringing a small quantity of venison; as this was the last time we should in all probability see them, several useful presents were made; which with our heap of preserved meat tins, broken iron hoops, and other refuse, the whole of which were collected and taken on shore previous to the breaking up of the ice, will maintain the recollection of our visit to several generations; and will set at rest any doubts among those of them who may require ocular demonstration of such a fact, so contrary to their ideas of nature as to amount to a miracle; for it should be borne in mind that none of these people ever saw a tree growing, and that they have a difficulty in obtaining drift-wood sufficiently large to make their sleighs.

## Remarks on Esquimos.

This perhaps will be the best place to relate the few facts we gathered concerning their habits and customs, and to describe Cambridge Bay.[32]

See Note 32, Appendix: Esquimos.

The costume and dialect agree (as did those we met with last year) with what is described by Sir E. Parry and Sir John Ross; they therefore belong to what Captain Washington in his vocabulary has appropriately termed, "*The Winter Island, Iglulik, or Central tribe.*" The line of demarcation between them and the Kotzebue Sound portion will in all probability be found to be the Mackenzie. The

number seen by us in this vicinity I estimated at between 200 and 300, of which between 50 and 100 returned in the spring; the inner harbour, the large lake west of Mount Pelly, and the peninsula about Cape Colborne, forming their hunting and fishing ground from May until October; at which period they follow the deer to the mainland, where having first collected together in the neighbourhood of the Finlayson Islands, they winter; but the precise spot we did not discover; it could not, however, have been very far from us, as we were visited continually during the winter. I fully expected to have found them on the Finlayson Islands in the spring, as it was usual for them to come from that direction; but on my visit in April, there were no signs of winter huts, although numerous *caches* showed them to be a place of great resort. Although not as much deprived of wood as those with whom Sir John Ross's voyage has made us acquainted, they must be considered as a land not a sea people, that is to say, they have not the materials wherewith to build an *oomiak;* two *kayaks* are all we saw among them, and these of such frail materials, that the one I have weighs only 26 lbs., and the keel is composed of three pieces of wood. So that there is no communication between Victoria Island and the continent, and very little between it and the islets along the coast, until the sea is bridged over by the ice. One portion of the tribe I presume remain on the main during the summer.

Wood is seldom if ever used as an article of fuel; seals' blubber being almost all that can be required in snow huts, where, if the temperature rise above freezing point, dissolution of house, bed, table, chairs, and floor ensues. In fact, the frost appears to do for them what fire does for us, render them dry and comfortable, and nothing can so seriously incommode them as a warm rainy day. Fish appeared to be the staple article of food, which both the sea and the lakes afforded in abundance; they are caught with copper hooks, or speared through holes in the ice, or from stone piers, built for that purpose. In the autumn the fine healthy colour of the men, women, and children showed they were well fed,

and contrasted strongly with our people; but in the spring I thought we had the advantage. Our biscuit was eaten as a curiosity, but neither it nor the salt meat relished; the preserved meat was, however, taken readily. A quantity of deers' excrement was collected, and is I believe had recourse to in times of scarcity as an article of food; but such did not seem to be the case this season, as we were never importuned for food; and my anxiety was relieved lest, in their desire to possess our knives, &c., they might have deprived themselves of sufficient subsistence till the spring. They may be considered as entirely a carnivorous race, and for the most part consuming their food raw. A favourite morsel is the yellow top-knot of the king drake, which they were usually permitted to bite off on paying us a visit. Water, although acceptable during the winter, is consumed sparingly. Tobacco and spirits they are so far fortunate as to be yet unacquainted with.

The aquiline nose and Jewish cast of countenance noticed last year was not observed this; but their features resemble the general characteristics of their race, viz., broad forehead, small eyes and flat profile, chin tapering to a point, hair coarse and black, no whiskers and but little on the upper lip or chin. The women are slightly tattooed, low of stature (one a mother being but 4 feet 3 inches high); when young not devoid of some beauty, but this, as is usual among natives where the female sex are looked upon as drudges, soon passes off; and to this I attribute in some measure the ill-success our looking-glasses had in the market. One great advantage they possessed over their brethren to the westward in our eyes, was the absence of vermin on their persons.

As will be seen in my journal, three only, and that on one occasion, were persuaded to remain on board during the night, and although very desirous to cultivate their intimacy, I could not induce them to venture again; perhaps my anxiety in this instance produced suspicion. Our communication, therefore, must be regarded as casual visits, in which neither party as yet could understand the other; but although guilty in some cases of theft, they have left with us the

impression that they are a kind-hearted, well-disposed people; and gave me similar feelings to those which appear to have taken place on the first intercourse between the inhabitants of the New and Old World.

Mr. Arbuthnot succeeded in inducing some of them to draw a chart of the coast to the eastward, which was several times repeated, agreeing very well with each other, but were totally unlike the coast afterwards travelled over by me. He also appeared to think they indicated a ship being there; but in my opinion it was a repetition of his question. They appeared to know the woman *Kablalla* mentioned by Sir James Ross, but had no knowledge of *Oogeolik*. But little or no iron was found amongst them, needles, knives, and fish-hooks being made of copper; an occasional iron or even a brass tip was seen on the arrows, and the few and well-worn beads on their persons showed that this was in all probability the first time they had come in contact with white men. Their arms, lamps, and other utensils correspond with Sir E. Parry's description; during the winter, the bow with its cover and quiver is left at home, and a short spear tipped with bone carried in lieu. Among their *caches* in the inner harbour were two or three triangular pieces of wood fitted with slings for the arm, and apparently designed to act as a kind of shield; one of the principal men among them was scarred severely across one side of his face, but I could not make out whether it was done in war or not; they at first with us carried their knives with the blade up their sleeves, and the haft in the hand, in readiness for immediate use; but notwithstanding the dread of our firearms may have kept them quiet, I am inclined to think they are an inoffensive race.

## Description of Cambridge Bay.

Cambridge Bay, or that part of Dease Strait between Finlayson Islands and Cape Colborne, is 30 miles from east to west, and 12 from north to south. The islands are formed by a ridge of basalt running in a S.S.E. direction from

Victoria Island to the continent. They are all small, the largest being rather more than 2 miles long by ¾ mile broad, rising towards the southern extremity in a long table-hill 160 feet above the sea. The island at a distance appears like two; the northern summit has a lake on it but does not rise so high as the southern; on the eastern side of the isthmus connecting these hills, the fragment of wood mentioned in my journal, as either belonging to the missing expedition, or brought there by Company's Factor Rae, was found. Our knowledge of the group is very slight, and the only soundings obtained were those in the ship, which on entering Cambridge Bay, passed to the northward of the large island, and within a cable and a half of the islet 2¾ miles N.N.W. from it. Here we had 6 fathoms, and then gradually deepening our water passed ½ mile to the southward of the next islet to the west. In this passage between us and the larger Finlayson was a low reef, so covered with ice as to be scarcely identified as land; and a low islet off the north point of the large island, which in this view appears like a sandy spit belonging to it. After rounding the north-western islet (having thick weather), we hauled to the northward and found anchorage ¾ mile from the Victoria shore, and where we rode out a strong north-westerly wind in smooth water; it is, however, exposed entirely from E.S.E. to S.S.W., and the shore too steep to afford anchorage until within a mile of the beach.

On leaving Cambridge Bay we passed to the southward of the large Finlayson, and between it and two flat reefs lying rather more than 1¾ mile to the S.S.E. of it. This channel appears clear of danger, with the exception of a rock awash 2½ cables from the bluff of the large island. These two rocks escaped the notice of Simpson, being very likely covered with ice when he performed his land journey, and too low to be seen from a boat; the distance between them and the two islets off Cape Trap is 4¼ miles; this is the broadest, and will probably be found the best entrance into the bay; the two islets are too small to afford shelter to a vessel, nor do I know whether there is sufficient depth of water inside of

them, but we found the lead a sure guide in working to the westward betweem them and Cape Alexander. The westernmost islet of the group is second in point of size and height; it lies 10 miles to the W.S.W. of the large one, and 5 miles to the N.N.W. of Cape Alexander; it is eventopped about 100 feet high, and there is a small islet near to it on its northern side. To the north of it again, 8 or 10 miles, is another low islet, the north-westernmost of the group, which the haziness of the atmosphere prevented me from fixing.

The channel on the Victoria shore appeared much obstructed by reefs. Nine and a half miles from the largest Finlayson on the Victoria shore is a long, low sandy point, at the back of which several round peaks arise, the highest of which I have named Mount Augusta; the point is shoal to, and the reef on which we struck, in running from our first anchorage to the spot where we passed the winter, lays about 4 or 5 miles south of it. I have, however, no means of laying it down, as we could scarcely see the land, owing to the haze; nor could I find any sign of it, by cracks in the ice, on either occasion when I visited the Finlayson Islands; the lead will, however, give warning on its eastern or western sides. To the eastward of Mount Augusta, 7½ miles, is Flagstaff Islet, under which we passed the winter of 1852–53; a narrow channel, navigable only for boats, separates it from Victoria Land. A mile and a half to the west of it are two low rocky islets, which are steep to on their southern side; but it is doubtful whether there is a passage to the northward of them; some soundings were obtained close in shore, but not sufficient to warrant a vessel taking this channel without further examination. A rocky ledge extends south-easterly 2½ cables from the southern point of the island, at the extremity of which there is only 8 feet of water; if the sun is out, the discoloured water will give warning from aloft; there is deep water and fair shelter to the northward of it; but, as will be seen by the chart, the water shoals suddenly, and there are several knolls with less than 3 fathoms on them. The island is ¾ mile long; on it are two hills, the northern being the

highest (about 90 feet). Several small tarns occur, from which we obtained fresh-water ice. S. ½ E., 1 mile from the south end of it, is Simpson Rock, 10 feet above the level of the sea, and over which the ice is sometimes forced. Our *cache* of provisions is on the N.E. side of it (the side facing Mount Pelly), 4 paces from the summit towards the water's edge. The rock is shoal to.

The coast-line of Victoria Land trends to the southward of east, 2 miles beyond Flagstaff Island, the shoal water in some places being 4 cables from the land; here, where there are two islets with shallow channels between them, the land turns abruptly to the westward, running back in that direction 6 miles, and forming a well-sheltered harbour; the western extreme is confined, but has deep water. Three miles from the point the sound separates, one arm taking a northern direction for a mile and a half, into the head of which three streams empty themselves, two of which are large, and have their origin I think in the large lake west of Mount Pelly, the shores of which will be found 2 miles from the head of this inlet; at the embouchure of the third, which is the eastern and smallest, we caught nearly all our fish. Eastward from the two islets at the entrance the channel is 1½ mile wide, and to the northward 2½ miles. The soundings are in many places uneven, and a vessel should enter under easy sail with a boat ahead. To the eastward of the entrance to the northern inlet, and nearly in mid-channel, is a shoal patch of 2 feet. Mount Pelly rises to the height of 800 feet 6 miles inland from the north shore of the inlet, the intervening land being low limestone hills, with lakes and tarns intervening; the eastern and southern faces of the mountain are very precipitous, and the summit a level plain. The large lake lies immediately to the west of it; in it are several islets, and two ranges of hills, nearly as high as Mount Pelly, will be seen near to its northern shores; with these exceptions the hills seldom rise to 300 feet above the sea. The isthmus forming the inner harbour is in one part nearly level with the water, and near to its western extremity is little more than ½ mile across; this is the

track used by the Esquimaux in the migration to and from the large lake.

To the eastward of the inner harbour the coast-line of Victoria trends to the westward of south; some few soundings were obtained in the cracks along shore before the ice broke up, and the channel between it and Simpson is apparently open. Along this coast are several islets and shoal inlets affording good boat harbours, and at the distance of 5 miles is a long low point apparently shoal to; here the coast takes a sudden turn to the eastward, trending first S.E. 3½ miles, and then east 7 miles to Cape Colborne. There is a sunken rock bearing N. 25° E. 2·8 miles from the low point; when upon it Simpson Rock bears N. 40° E., summit of Flagstaff Island, N. 24° E., Mount Augusta, N. 45° W., Finlayson bluff, W. 3° S. We obtained no soundings in its vicinity, and therefore cannot say whether it is connected with the shore or not. Lieutenant Jago, who followed the coast-line round beyond Cape Colborne, found it trend east instead of N.E., and at the distance of 20 miles entered Rae Inlet, which has an islet at its entrance, and, running back 4 miles to the westward, forms another very good harbour; from the head of which he crossed over land to the head waters of Cambridge Bay, the distance as the crow flies being 20 miles.

At this period the deer were waiting for the freezing over of the straits, and had assembled in large herds; he estimated the total number seen in the course of his journey at 1500. Afterwards, in the first week in November, when crossing to the American Continent, we fell in with the footmarks of several hundred; there is therefore little doubt that the Finlayson Islands and this peninsula are the usual crossing places in the autumn; the distance of the latter from the main is 10, and of the former 7 miles.[33]

See Note 33, Appendix: Animal and Vegetable Life.

The vegetation was much more scanty than at our last winter quarters, and there appeared little or no soil; we dug up and used as fuel a considerable quantity of peat, but it

was very inferior as an article of fuel. The climate evidently, although we were a degree and a half more to the southward, was more severe; scarcely any willows were seen, and on our arrival we found old ice aground on the lee or southern side of the straits and bays, which was not the case at our former winter quarters.

Ducks and ptarmigan were more numerous, hares scarce, and owing to the open nature of the country we were very unsuccessful with regard to the deer, though numerous.

The hills are covered with small angular fragments of yellow limestone, which appeared *in situ* only at Mount Pelly and in Rae Inlet; on the beaches were rolled stones of porphyry, basalt, and greenstone, the latter very compact. I found shells, apparently not very ancient, about 20 feet above the present mean tide-level; and the coast-line in several instances showed traces of three ancient beach marks, by which I am inclined to think the sea here is subsiding. It is high-water upon F. and C. days at 11½ hours, and the rise and fall varied from 0 feet 7 inches to 2 feet 4 inches. The set of the tide was so irregular and so dependent on the wind, that I cannot say whether the flood comes from the east or the west. The easterly set certainly prevailed after the ice was in motion, as it disappeared in that direction, and lodged on the western shore.

## Ship under Weigh for the West.

The first star seen this season made its appearance on the 9th of August, so that our days began to darken before we had moved from our winter quarters; this is perhaps the most serious difficulty to be overcome in accomplishing the passage from the Atlantic into the Pacific. A considerable quantity of open water having made to the westward, we weighed at 5 a.m. on the morning of the 10th, and tried to work into it, but the narrowness of the channel between the ice and the reef, together with the current, prevented our gaining anything to windward, and after one or two narrow escapes from getting aground, I had to return to our anchorage at 9.

In the afternoon the wind drawing round to the north permitted us to get out when we found an open sea to the westward. Nothing is more surprising than the sudden disappearance of the ice in this manner. I do not think there was a single individual in the ship that expected we should be able to move the night previous, yet in less than 24 hours there is not a fragment of ice to be seen in the direction we are bound. The wind proved light and variable, and we made but little progress, and during the forenoon of the 11th were driven by the current so far to the eastward as to sight Cape Colborne; from the mast-head we could perceive the pack resting on its base, but we could not trace it across to the continent. The breeze increasing in the afternoon enabled us to beat the current, and we succeeded in reaching the Finlayson Islands by 4 a.m.

In working through between the large island and the reefs south of it, a rock awash 2½ cables to the southward of the former was discovered. During the forenoon we were enveloped in one of those harassing thick fogs, infinitely more impenetrable to the vision than the darkest night; the wind unfortunately left us opposite to the centre of the island, and the water being too deep for anchorage, it became questionable at one time whether the current would not carry us back into Cambridge Bay, or in its attempt to do so lodge us upon one of the many reefs about these islands. Providentially the wind came to our aid, and dispersing in some measure the fog, we were enabled to feel our way along the shore of the continent, but did not succeed in getting round Cape Alexander until 1 a.m. on the 13th of August; that Cape apparently is not steep to, as a considerable quantity of ice yet remained in the slack water to the east of it. Making all sail we hauled across the strait to the Victoria shore, and passed Byron Bay at 8 a.m. Our fair wind failed us at noon, but we made progress against the current, only, however, succeeding in passing between Bate and Kellet Islands at noon on the 16th. Then getting a slant of wind from the N.E. we made rapid progress, reaching Miles' Islets at 7 p.m.; here, however, we came in with the

ice, through which we were enabled to reeve, until we reached Douglas Island, when it was so closely packed as to block our further progress, and subject us to the vexation of having a fair wind without being able to make use of it. On the 17th of August, after several ineffectual attempts to get to the southward, where we hoped the influence of the Coppermine River would occasion open water, we tried the north shore and succeeded in getting into the land water on it, but almost immediately afterwards took the ground on a reef about 2 miles from the shore. The kedge anchor coming home, we had recourse to the stream and hove off, the cable parting just as the ship started. After recovering our anchors we continued to work to the westward, crossing over the shoal in 7 fathoms, and obtaining deeper water in shore of it.

As we approached Point Becher (Lady Franklin Point?), our channel narrowed, and it became evident that the passage between it and Douglas Island was blocked as close as ever. We, therefore, made our way again through cross ice to the southward, and after trying in all directions were frequently close beset; the ice opening now and then enabled us to maintain our position pretty well until the 20th, when we were carried away in the pack to the S.E. at the rate of 1 mile per hour; thus utterly helpless, we gradually shot past the Bayfield Islands, and approached the archipelago named after Sir E. Home. At midnight we were close to a reef on the north side of an islet, nearly midway between the two groups, but by the mercy of God passed it without touching, having 12 fathoms of water, when within a cable's length of it, and 51 immediately afterwards. The current then carried us farther to the southward, and at noon we were opposite the south end of the archipelago, and about 4 miles from it with little or no drift. In the afternoon the ice slackened off, but not sufficiently to warrant our making sail, until day broke on the 22nd of August, when we made sail and bored through into a lane of water by 5 a.m., which extended up to the Saunders Islands; on reaching them we found a close pack, but had the gratification to see the land water over it under Mount Barrow, but which we did not

get into until 6 p.m. on the 23rd of August, and were opposite Cape Krusenstern at half past 10, when being unable to see our way amongst the sconces,* and fearing to get beset by taking a wrong lead, I hove-to for daylight.

When morning broke the wind had got round to the eastward, and we made all sail. The soundings were very irregular, but the least water we passed over was 6½ fathoms, and to the north the low reef between Lambert and Douglas Islands (which we had seen last year) was seen with a close pack to the north of it, apparently filling the whole space between it and Point Becher. Our fair wind failed us at 8, but the tide favouring us we made good progress until noon, when we were abreast of the west point of Lambert Island, and the wind then failing we dropped alongside a large floe, to which I made fast. Finding, however, that we were rapidly setting to the eastward, I sheered off and came to with the bower; unfortunately the act of sheering gave the floe a slew and brought the point of it across our hawse; the cable cut into it immediately and there became fixed, notwithstanding all our efforts to free it. After veering to 60 fathoms and driving a considerable distance, I began to fear our windlass would not stand the strain, and therefore slipped; although we had a boat under the bows in readiness to pick the buoy up as soon as it came from under the ice, it never showed, and the buoy of the anchor having been carried under water, in consequence of the buoy ropes being dragged through the mud, we were without the means of knowing the exact spot where the anchor was. However, we came to in the vicinity, and as soon as the tide slackened set to work to sweep for it, but without success; while so occupied a second floe came across our bows, but as the tide was nearly done, I did not fear but that we would be able to shove it clear while the ship was tending; in this I was mistaken, as the tide turned rapidly, and we found ourselves with our head to the eastward, and the floe more firmly fixed than ever. As it was improbable that the strain could be borne when the tide made, no time was lost in trying to ship the cable over

* *Sconce*, "a bulwark," *Johnson*; used here as an isolated mass.—[Ed.]

the floe by means of a 6-inch whale line, which we succeeded in doing; in fact, the armourer was putting the bolt in when the tide brought another piece of ice upon us; the whale line parted, and we had the mortification to see the end of our second chain run out of the hawse. [Thus losing two bower anchors in as many hours.] Before the sheet cable was bent, and that anchor stocked, we had drifted 6 or 7 cables, and at length brought up close to a large piece of ice, which proved to be aground in 6 fathoms of water; as soon as we ascertained there was sufficient water alongside of it for us, we weighed, and hung on under its lee, thereby avoiding all the floes that floated past us. At midnight, being slack tide, we shifted round to the eastern side, and I intended when daylight broke to have dropped up to our buoy, and picked up the second if not our first anchor; the morning, however, proved so very thick that we could not see the length of the ship, nor did it clear off until the western tide had made so strong as to preclude any hopes of reaching the buoy before noon.

A disinclination to leave two anchors and cables behind me, without making another attempt to recover them, made me hesitate at first, but the impression that the advanced period of the season rendered it more imperative not to lose 12 hours of a fair wind, prevailed. Accordingly as soon as we could see our way through the mist, which was shortly after 7 a.m., I slipped from our friendly floe, and made all sail to the westward. At 10 Sutton Island bore north of us; shortly afterwards the fog again enveloped us, and our compasses being still useless, we kept unfortunately to the northward of the mid-channel course, and shortly after 1 p.m. came in among ice; when the sun came out and enabled us to correct our course, we found ourselves nearly into the land water on the Wollaston shore, and had to haul to the southward through the pack, which was fortunately loose enough for us to reeve through until we reached the open sea on the American shore. At 8 p.m. the wind failed us, and when it sprung up again, being unable rightly to tell its direction, we were compelled to wait for daylight. In the afternoon the

wind drew round to the S.W., and we made all sail out of the straits, running through loose pieces of ice. The carpenter finished the anchor stock on the afternoon of the 27th, and we had the satisfaction of seeing two serviceable anchors at our bows.

The weather continuing very hazy gave us only occasional glimpses of the land, and we ran close past Clerks Island without being able to distinguish it.

*August 28th.*—Our compasses now began to traverse, giving us the means of maintaining our course in the absence of the sun or stars. Towards midday the wind drew round to the westward, and I made a long stretch to the northward, reaching within 30 miles of Cape Erebus (Nelson Head), which in the evening we saw the loom of. In the morning we got sight of the land to the southward, which I hoped would prove to be Cape Parry. But on obtaining the longitude I found we had been set to the eastward, and were in Darnley Bay. In the afternoon the wind backed round again to the southward, and by 10 p.m. we were abreast of Moore Islands, and could make out a dark shade between us and the continent; when opposite to them we shoaled the water to 20 fathoms gravel, and then got 35 mud, and afterwards 22 gravel; so I am inclined to think that shoal ridges will be found extending easterly from them and the Cape. I estimated our distance at 5 miles. By midnight we were past Cape Parry, and were making good way at the rate of 6 knots per hour. By my observations the Cape is nearly a degree (of longitude) or 18 miles too far to the East upon the charts; which error probably arose during the circumnavigation of Franklin Bay, and Sir J. Richardson not having a chronometer with him, had no means to correct his reckoning. When off the Cape we fell in with several heavy pieces of ice, being the first we had met with since leaving the Dolphin and Union Straits.

During the 30th of August we came in among loose streams, which in the course of the day became so cross as to compel us to seek a clearer road in shore, affording a strange contrast with the state of the ice here at the same

period two years ago, when the pack was 30 miles from the land; now, to all appearance from the mast-head, it was resting on Trail Point. We managed, however, to push to the westward through floes, which however gradually increased in size until 11 p.m., when, being unable to see the leads, we were compelled to wait till daylight. On its breaking I found the view to the westward so unpromising as to induce me to prefer working into the land-water; while doing so we fell in with a bear and succeeded in shooting him. It was 4 p.m. before we reached the open water, and got at the same time into 13 fathoms water, being about two miles from the shore. In several of the ravines a column very like smoke was seen, but it may have been mist thrown up by the eddy wind under the high cliffs. At 7.30 we could see over the low spit at Cape Bathurst, and made out several Esquimaux tents on it; after we had passed their encampment they launched an *oomiak* and followed us as long as we could see; I would have stopped for them, but easterly winds had been so few and far between that I could not afford to lose even an hour; and was also desirous of rounding the Baillie Islands before dark. This we accomplished shortly after nine, and then got a fresh wind out of Liverpool Bay: the darkness combined with heavy cross ice compelled us to shorten sail, and make short boards in an open space until day broke, when we bore away through a heavy stream, and reached a comparatively open sea in the course of the afternoon; the temperature of it rising to 36 gave us hopes that we had reached the warm water of the Mackenzie; several whales were seen both yesterday and to-day.

On the morning of the 2nd of September, being calm, an easterly set of 1·2 per hour was experienced. At 5 a.m. the wind sprung up from the N.W., to which we made all sail on the starboard tack, and shortly afterwards passed two bears on a large floe: at 10.30 we got sight of the land, and during the afternoon made short tacks among straggling pieces, and seeing a piece of drift-wood occasionally. The wind continued light, but drew round to the S.E. by noon on the 3rd of September, bringing a thick fog, which however cleared

off towards sunset, and gave us a view of the Richardson Mountains; but we saw nothing either of the Pelly Islands or our discoveries in 1851. Towards midnight the breeze again failed us, and we experienced the same difficulty as before in this neighbourhood in steering the ship; but little progress consequently was made on the 4th of September; but on the 5th we passed Herschell Island. Here we were however barred by a close pack at midnight, and when daylight broke were compelled to retrace our steps, and tried without success to get into a lane of open water to the westward of the island. The wind failing, the current drove us back to the eastward of the island again, having 29 fathoms, about 4 miles from the shore. When the breeze sprung up from the westward, we endeavoured to hold our own by working to windward; the closing of the ice put a stop to this on the morning of the 7th of September, and we made fast to a large floe, taking advantage of a pool of fresh water on it to fill our water tanks. On the 8th the wind got round to the N.E., and caused the ice to slacken; we cast off at half-past 3 a.m., and tried to get into a lane of water to the N.W. The fog clearing off gave us a glimpse of the land, which proved to be Point Kay, by which we found we had been driven back altogether 40 miles since midnight of the 5th. By 8 a.m. we reached within half a cable's length of the land-water, and during the forenoon, by warping pieces out of the road, were within half our own length of it; but here the floes being aground, and not affording sufficient depth of water over the tongues of ice for the ship to pass, we were completely baffled, nor could all our sawing and blasting effect our escape; but as fast as we got a tongue separated and the channel open, the floes closed, and from the immediate vicinity of the ship I could not make use of heavy charges of gunpowder. With a galvanic battery and simultaneous discharges of six or eight 8 lb. charges we should, I have no doubt, have effected our escape. Bickford's fuse, although answering its purpose admirably, cannot be regulated with sufficient nicety.[34]

See Note 34, Appendix: GUNPOWDER IN ICE.

While thus occupied, expecting every trial to see a successful result to our labours, four *kayaks* came off from Point Kay, and after a little hesitation came on board, when a few presents soon quieted their fears. The *labret*, costume, and dialect proclaimed them to be of the western tribe; and the gratitude for small quantities of tobacco showed that the use of this weed has spread along the coast since 1825, and proves that the traffic from Michaelowski in Norton Sound reaches 1000 miles along the coast. From all I could make out, I understood them to say that they had seen one ship and two boats. In the afternoon the women came off in an *oomiak*, and we obtained a few fish and a little venison. Notwithstanding our endeavours to show them that our blasting was not intended to alarm them, they went off shortly after one of our explosions, and did not again return.

All this time we had the mortification to be losing a fine fair wind; but all our devices were unavailing till noon of the 9th of September, when we effected our escape, and got along shore inside the grounded pieces, which for several miles were closely packed, and edged us at last into shoal water; on rounding one point we got into $2\frac{3}{4}$ fathoms; fortunately she never touched, and on approaching Herschell Island we found an open lane, and at 4 got into a large expanse of open water opposite to it. The ice had so far cleared away as to permit our running all night. A fog, however, unfortunately overtook us shortly after daylight, and we got alongside the weather edge of a large floe, which it took us three hours to extricate ourselves from. The ice proving very close we hauled to the southward, in hopes of getting clearer leads in shore, and by noon were about a mile off the low narrow sandbank which fringes the coast to the east of Point Manning; the pieces here were thickly strewed and most of them aground. At 5 p.m., in attempting to bore through what appeared to be a slack point, we got fixed, and could not extricate ourselves until the following morning, when the ice suddenly broke up and liberated us. The rudder being unshipped, the foresail was set in hopes of

wearing her round before the water became too shoal; but as she did not pay off I was compelled to come to. The state of the ice to the westward was very unfavourable, but being unwilling to lose an opportunity, we weighed after shipping the rudder, and with some difficulty accomplished 8 miles; when our progress was effectually barred, and we brought up under the lee of a heavy floe, aground in 4½ fathoms, to which we made fast with three whale lines, and rode out a strong breeze, proving that a grounded floe is a good anchor. We had, however, the melancholy contemplation that the ice every hour was packing closer, and had to sigh for a foul wind.

The wind having moderated somewhat by noon of the 12th of September, but the ice to the west forbidding our progress, the boatswain and carpenter were sent to the sandbank (about a mile distant) for drift-wood. With some difficulty they found a lead into it, and brought off seven boat-loads, which made me some amends for our delay, fuel being the only article we were seriously in need of; the spring examination of provisions and stores having proven that by neglect we had not taken on board the quantity demanded at Woolwich by 18 tons. The ice not permitting our progress, the visits to the sandbank were continued next day; it proved to be a narrow strip of sand scarcely above water, but such was the deposit of wood upon it, that the carpenter reported we had made no impression. Among other pieces he found one sufficiently large to make us a topmast; but, on proceeding to trim it, it was found partly decayed on the lower side, but made a very good plank. Mr. Phayre's dog Neptune was sent on shore for a run, but, either owing to want of water or some other cause, he fell in a fit and died, causing general sorrow on board, where he had made himself a great favourite. In one or two places the wood was piled up by the Esquimaux, and one grave was seen. The mainland appeared 1½ mile distant, and the water apparently shallow between the sandbank and it.

The ice appearing on the move, I did not send the boats

away on the morning of the 14th of September, and cast off from the floe at 9. On hauling to the north we managed to find a lane, and fortunately got through a very narrow channel into a nearly open sea in Camden Bay. Thus running along cheerfully, and calculating the number of hours, if our fair wind held, that would restore us to the civilised world, we occasionally got a sight of the land through the fog, and seldom lost sight of the pack to the northward, the depth of water varying from 5 to 7 fathoms. At 6 we got sight of Flaxman Island, but abreast of it was a long point of ice aground, against which floes had become entangled, so as to render it necessary to pass between it and the island; in attempting this we got into $2\frac{3}{4}$ fathoms, when I hauled out, and just saved her from going on shore by one of those fortunate chances which have occurred more than once in my life, and render me, I trust, grateful and mindful of God's mercy. The ground was soft, but a ground swell was setting in, which must have done us considerable damage; and the wear and tear to the health of the people in getting her afloat would have been a serious commencement to our third winter: seldom has my mind been relieved from a weightier burden than when the head yards swung in stays, and she was clawing off shore.

On a careful look from aloft, I had every reason to think that there was not water sufficient for us, even were we round the point; and therefore looked out for a large grounded floe, where we might lie secure, and wait the issue of a change of wind. We accordingly made fast on the western side of one aground in $7\frac{1}{2}$ fathoms. When morning broke I sent Lieutenant Jago to examine the open water the other side of the ice. The boat rounded the point in 2 fathoms, and, after hauling to the north, got into shoaler water, and eventually grounded; the ice had therefore proven our safeguard, but the easterly wind had so packed it on the western horn of Camden Bay as to render our escape doubtful. Still we clung to the hope that it would change, and that a few hours' southerly or westerly wind would effect our release.

## CAMDEN BAY.

Two bears took the water from the floe opposite, and swam up within a cable's length of the ship. The lowering of a boat on the port side alarmed them, and they swam so fast as to get to the packed ice before the boats could turn them, and then pursuit was out of the question. Although ungainly in their gait, it is quite surprising to see the rate at which they make way over rough ground.

The temperature of the sea fell to 28°, and loose pieces of ice drifting down on the close pack, gradually filled our hole up. The floe to which we were fast was apparently split into two, forming a dock, into which I moved the ship on the morning of the 16th of September, as the pieces crossing under the stern now passed close to us. Thus we remained, a fine favourable wind proving our bane, until the 22nd, when it fell calm, and I moved her across our now complete dock, for egress was barred, to what I hoped would prove the weather side, and a better position for making sail from. The ice slacked off a little; but the wind again prevailed in its old quarter, when it all closed, and a considerable number of loose pieces had now collected to the eastward of our floe. On the 26th of September young ice made over our hole, and gave me warning that we were most probably fixed for the winter. I accordingly reduced the allowance of rum to half a gill, and tea and sugar one-sixth. These were the only articles, except fuel, of which we had not abundance. The former we could spare better than anything else, the reduced allowance being in fact the established allowance of the Navy; the reduction was occasioned by our being supplied with spirits over proof, which, in the course of our long voyage, had not only evaporated, but become weaker; a considerable quantity of tea had been used by our travelling parties in lieu of cocoa; and the sugar proved deficient in weight, owing, I presume, to the frost having penetrated, and extracted the moisture. The inconveniences thus were slight, and there still was issued, in addition to the allowance, ¼ lb. of

beef on salt meat days, and the same quantity of barley, rice or carrots on preserved meat days.

A light westerly wind on the 27th of September fanned our hopes, but it did not freshen sufficient to break up the young ice. Some pieces drifted from the eastern edge of the floe, and in the evening of the 29th a crack in the newly-formed ice (now two inches thick) in our dock took place, which led me to expect some pressure. After a little uneasiness all became quiet, and we became convinced our liberation would not be effected until the spring.

## SECTION XV.

### Camden Bay.

### Winter and Spring, 1853–4.

Our patent fuel for the travelling parties had made an inroad into our stock of oil—fortunately a large supply of candles had been as yet but little resorted to; and, on examination, I was glad to find that we should not be subject to serious inconvenience on that score. Sir J. Franklin's remarks on the scarcity of drift-wood after passing Flaxman Island rendered it necessary to be very economical with this article, until we could ascertain the practicability of increasing our store. One or two pieces were seen on the ice not far from us, and, as it was now sufficiently firm to bear, a party was sent out on the 1st of October, and brought in a good-sized log. On the 3rd, the water to the eastward of us having completely closed up, I left the ship, accompanied by three men, for the shore; after nearly an hour's bad walking, we succeeded in getting off the packed ice on to the new ice, and reached the shore about 5 miles from the ship, where I had the gratification to find abundance of the article I was in quest of. On our way back we fell in with a reef, or sandbank, at the distance of half an hour from the main, and which appeared to be a continuation of the shoals extending easterly from Flaxman Island; on it was one very large tree, and a considerable quantity of smaller wood. By following the smooth ice, we had a good path until within 20 minutes' walk of the ship. On the 4th of October Lieut. Jago was despatched with two sleighs for wood; one of the crew becoming, however, exhausted, but one load was brought to the depot at the edge of the rough ice; in the afternoon

another party was despatched, but we found the daylight barely sufficient for two trips a day.

*October 4th.*—The next morning I left the ship, provisioned for eight days, with the intention of reaching Barter Island, and opening a traffic with the Esquimaux. At noon we came to the shore at a low point, on which was a summer hut; and then, pursuing a course along shore, left Boulder Island outside of us. Several foxes and one wolf were seen prowling about after the ducks; we picked up six or eight with their heads torn off. The ice now became very thin, and one spot being still open, we found fifteen pintail ducks on it so exhausted as to be unable to fly. During the afternoon we came upon a heap of ice 15 feet high, consisting of pieces about 4 inches thick piled on top of one another, which led me to think we must be opposite the mouth of another river, a thaw in which had moved the newly-formed ice over a shoal, and caused it to pile in this extraordinary manner. The weather was, however, so hazy as to prevent our seeing far. At 5 we reached a low cliff, from whence the coast range of hills rose immediately. The following day proved fine, and the mist clearing away gave us a good view of the Romanzoff range. After crossing a long shallow bay, we came at 10 upon a shingle point, on which were ten small and one large hut, all so casually constructed as to assure me they were only temporary abodes; then continuing our course along shore to the westward, we crossed fresh bear tracks, and on the cliffs I met with a footprint resembling a wolf's, but much larger. At noon we reached another point, on which were several residences; recent footmarks and chips showed they had been tenanted but a short while before. Then crossing what is most probably the mouth of another river, but very shoal, we camped on low ground, over which a bear had been tramping. On the 7th of October we had to contend with a fresh easterly wind and thick weather, which, instead of improving, became worse. Seeing several of the men frost-bitten about the face, I was induced to camp at noon. The weather did not permit our moving the following day, which was passed most uncomfortably, everything being saturated

with moisture, and the cold insufficient to extract it. The dogs finding our pork-bag open, helped themselves; and on going to the sleigh for our breakfast, we found our four days' allowance vanished. The easterly wind and the drift prevented our moving also on the 9th of October, nor, during the whole time we were camped here, could we see much more than a cable's length.

The weather still remaining thick, we retraced our steps on the morning of the 10th of October, and camped on the site occupied by the ten huts. Foot and keel marks were yet visible on the shingle, and I fancied I detected a sleigh track; it did not however extend to the ice. The large house under the lee of which we camped, appeared to be used as a banjo-shop, as we found the frames of two tambourines, which, after replacing them with a few presents, I made bold to carry away. The 11th also proved a bad day, the wind having now freshened from the westward, and the sun being obscured, I had nothing to steer by, and was but too glad when we came upon our old track, which led us two miles beyond the heap of ice, when it became obliterated. Taking the wind for our guide, we came in with the shore at half-past 2, but being unable to recognise the locality, and knowing we could not be much more than half a day's journey from the ship, I camped in hopes of better weather in the morning, and fearing to lose my way among the sea ice. The wind blew very violently during the night, and we were roused up about 4 by the two men at the mouth of the tent reporting that they were lying in 6 inches water; with considerable difficulty we managed to get the tent door opened, and found ourselves silted up, the tent being nearly buried. While breakfast was cooking it was dug out, and we started in a thick fog, hoping to come across our own, or the tracks of the sleighs wooding; seeing land through the haze to the north of us, I at first took it to be Boulder Island, but shortly afterwards found that it was part of the main, and that we were most probably in the mouth of the Canning. So striking across the land in nearly a north direction, which a casual glimpse of the sun enabled me to

take, we again reached the ice, having dragged the sleighs over nearly two miles of low ground, interspersed with several lakes; steering N.W., from the shore, we shortly came among hummocks of ice, and, the fog lifting, got sight of the ship at 11, and arrived on board at half-past 1. All suffered from frost-bites, and the wet condition we had been in since our departure; fortunately nothing serious occurred, and we had only to lament that our troubles had not been rewarded by accomplishing the object we had in view, nor had I been able to do anything with regard to the survey of the coast.

### Winter Arrangements.

On board they appeared to have experienced better weather, and had been able to carry on the wooding, fetching off nearly every day two sleigh-loads. The pinnace was hoisted out and put on the ice at a little distance from the ship in the event of fire. As we had now wood suited for the purpose, a large caboose was built around the fore hatchway; and when the weather did not admit of the men going for wood, the main hold was cleared, and the deck-load of provisions got out. The weather continued so inclement, I began to fear we should not complete our stock of wood before the days proved too short; consequently after the 22nd of October four sleighs were sent every fine day, which took every disposable hand, except those disabled by sickness, who kept the watches. It was not, however, till the 7th of November that we succeeded in depositing within a mile of the ship 76 sleigh-loads, which I calculated would last us till the spring. The sky appeared constantly loaded with mist, so much so that I was unable to obtain sights for time, to rate the chronometers, before the sun had gone too low for the artificial horizon. The condensation of the lower deck also proved worse than we had experienced previously, making me fear very seriously for the health of the people. By building a ventilator over the main hatchway, we got rid of a portion of it; but all our remedies proved ineffectual to remove the constant drip, compelling us to wipe the lower

deck beams and overhead in the officers' cabins constantly. Sixteen men were berthed in the orlop deck over the main hold, and thereby enabled to keep their blankets dry, and the bedding of two men was spread out every day at the back of Sylvester's stove.

On the 4th of November we had to deplore the death of another shipmate, Wm. Greenaway, A.B. He had been suffering for a considerable time, being afflicted with dropsy in addition to scurvy, and the surgeon had despaired of saving his life for a considerable period. His body was committed to the deep the following afternoon. This deprivation reduced our sick list to four, only one of which was a serious case. The remainder of the crew appeared in better health than at this time last year; and all symptoms of scurvy, with the exception of a slight case (the assistant surgeon), had disappeared. A solitary duck, apparently nearly exhausted, flew past us on the 5th of November; during the previous week we had noticed two large flocks going to the westward, and had procured a few, which were reserved for the sick.

Our wooding being completed, an observatory and the snow houses alongside were commenced. On the anniversary of the Prince of Wales' birthday, half a pound of pemmican and a quarter of a pound of potatoes was issued in addition to the allowance. The following day we experienced a severe gale from the westward, which induced me to spread our housings, which I had hitherto kept below, wishing to enjoy as much light as possible. As we had experienced some violent winds from the westward, a snow wall was built across the quarter-deck, just before the mizen-mast, which, rising as high as the housing, effectually sheltered the deck.

Our daily routine presented less to enliven us than either of the preceding years, the shortness of the day forbidding access to the shore; it was fortunate that there was some occupation in bringing in wood from the depot and sawing it up, besides building our snow houses; but strong breezes prevailed so frequently, that I doubt even

had we been closer in shore much game would have been obtained.

The ice alongside the starboard side gave way under the weight of our porch and skittle alley, and compelled us to remove the site of the latter to the floe, where it and a billiard-room were commenced. The transit house opened into the latter, which afforded me a sheltered walk during the intervals between the moon and stars transits, but owing to the drift and cloudy atmosphere I obtained but few observations.

The theatre opened on the 1st of December, with 'Hamlet' and the 'Irish Widow'; the stage being moved a little further forward gave the performers more room, and some attempt was made in introducing a little scenery; so the performance went off with great *éclat.*

Mercury froze as early as the 4th, being three days earlier than the first, and eleven than the last year. The temperature remaining low until the middle of the month, and as October and November had both proved colder than the preceding years, and the ice was thicker by 2½ inches, I began to fear we were going to experience a severe season. Easterly winds, however, prevailed during the latter portion of the month, bringing with them milder weather, the mean temperature proving −25°, which is 5° warmer than last year, and 8½° colder than the first.

We had no venison for our Christmas fare, but I issued half a pound of pemmican and a pint of wine, upon which the people made a very good dinner, and fared nearly as well as the officers, as our private stocks were now almost exhausted. The dogs came in for the greater portion of the hind leg of a bear, which had been reserved for the occasion, but although fresh, was pronounced not to equal either Sir J. Richardson's admirable pemmican or Mr. Gamble's excellent preserved meat.

The state of the ship's company's health was, as will be seen by the opposite page, a subject of great congratulation.[26]

See Note 26, Appendix: HEALTH.

The sick list had contained but a solitary individual for a considerable period, and this was a case of consumption, which had been under the surgeon's hands upwards of a twelvemonth. The mean for the twelvemonth is 3·9 or 6·5 per cent., that of the previous year being 7 per cent.; so I have every cause to close this book (*Vol. I. of MS. Journal*) with heartfelt thanks to Almighty God, who has preserved us, I hope, to praise and glorify His name.

R. C.

*Vol. II. of MS. Journal.*

During the early part of January, 1854, part of the funnel of Sylvester's stove required to be replaced, which occupied the armourer three days, and gave us an opportunity of seeing the great benefit we derived from its admirable construction. The heat which it diffused immediately throughout the ship and its effect in compensating the moist atmosphere was at once apparent. Owing to hazy weather and strong winds, our lower deck, though warmer than in the preceding years, was considerably more wet, and great inconvenience was experienced in the cabins from constant dropping. We had recourse to swinging stoves, and tried several means to improve the ventilation, but without success; fortunately the month proved a very mild one indeed, the thermometer rising on one occasion to + 27°, and enabling the people to get up a game of rounders by way of variety.

On the 17th of January, the days having lengthened sufficiently, we made an attempt to increase our stock of fuel, and got in four light sleigh-loads, from the large tree on the reef, which proved to be 94 feet long, and 14 inches in diameter at the smaller end. The weather, although warm, proved so windy, that we only procured one other load before the close of the month. A succession of westerly winds accumulated a heavy snow-drift under the bows, under which the ice gave way, surprising everybody, the general impression at first being that the pack was in motion.

In February we managed to eke out our stock of oil, by boiling down two casks of bears' grease, and got therefrom a

seasonable addition, although it had a flavour very different from Mr. Atkinson's preparation.

A trial was also made to recover some of the wood, which was frozen in by the ice giving way under the heap at the depot, by blasting with gunpowder; but 20 lbs. had no effect, and the weather proving very severe, there being but four days during the whole month that would admit of the people going for wood, I had to draw upon our stock of coal. The mean temperature of the month proved to be – 31° 8′.

On the 9th of March, to enjoy the light, we furled the quarter-deck housing, which at once diffused cheerfulness, and we began to look upon the summer as coming. Preparation for the departure of the travelling parties also caused occupation; but the wind continued to blow, frequently with violence, so that our communication with the shore was very limited. On the 23rd the main-deck housing was furled, and our theatre closed for the season, having again been a source of occupation and amusement.

Having completed the moon culminations for the month, the transit instrument was taken down in the beginning of April, and the carpenters fitted up the transit house as a place of shelter for the shooting parties, which, from the convenience of a window and a stove inside, would prove more comfortable than a tent. As we were now more likely to be actively employed, and owing to our distance from the shore had little chance of obtaining game, I increased the ration of pork from ¾ to 1 lb. The shooting party bringing back seven ptarmigan on the 15th of April, the house was put upon shore on the 17th, the carpenters and party staying there during the remainder of the week.

## Spring Expeditions.

We had been quite prepared for departure, but the weather was so unpromising, that I did not set out until the 25th of April, and then with three sleighs, two of which were equipped for six, and the third for twenty-seven days, we struck due north, hoping soon to come upon large floe pieces, and find a

more promising road. The sleighs, even with the distributed load, complained, and several severe falls were experienced by the men. At 10 a.m. the following morning, finding our prospect of further advance, unless the road speedily assumed a smoother aspect, extremely hazardous, I halted the sleighs, and pushed on through a confused mass of hummocks, from which the snow-drift, owing to the prevalence of easterly and westerly winds, lay in ridges directly across our path; so that our progress in either of those directions might have been practicable; but the difficulty of mounting the steep sides of the ridges, and the strain upon the sleighs in their descent, forbade all hope. I therefore returned, and with sorrow gave up an attempt which, independent of the main object of the expedition, I had looked forward to with much interest; thinking that, with anything like a favourable road, I should reach 73° N. lat., and settle the question with regard to the open sea, which certainly does not appear to exist here in the same manner as it does to the north of the Asiatic Continent. Scarcely had we turned when one of our sleighs broke down, and we were compelled to bring our loads back by relays. One of the men also got so severe a fall as to be picked up insensible; not being missed, he lay for some time where he had fallen, and we had difficulty in restoring the warmth.

The shooting party at the house managed to pick up a few ptarmigan, but the blustering weather hindered our communication. On the 15th of May I set out in hopes of finding the Canning, and reaching the summit of the Romanzoff chain; we traced the coast-line easterly, but the snow proved too deep to discover the embouchure of the river. I accordingly, on the second morning, struck inland, and found the ground in many places bare, with pools of water. At 2 miles from the beach the hills rose suddenly to the height of 50 feet, and then formed a table-land, with occasional broad water-courses, in which were rolled stones and stunted willows. The table-land was clothed with coarse grass, and we came upon the recent trail of three deer and a glutton in chase. Ptarmigan were numerous, and we picked up 30 during the day. The 17th proved foggy, and we had to

grope our way, but at 3 p.m. reached a steep acclivity, where I camped, feeling assured we were not far from the foot of the chain. The western face of our hill was very abrupt, and the haze preventing our seeing the bottom, added to the deception; our rise had been scarcely perceptible until the last half mile, but on reference to the aneroid, I found we were nearly 1000 feet above the sea. Much to our surprise here we found the recent track of a bear. If a polar one, the mark would betoken a cub of the second year, but I was not aware that they were in the habit of straying so far from the sea-shore.

The mist cleared off in the morning, and showed the range rising like a wall close at hand. Leaving the tent I set out, and crossing the valley, reached the foot of the range in an hour and a quarter, the aneroid showing a height of 1600 feet. In another half-hour we gained a steep face, the sides rising at an angle of 35°, the soil totally disappearing, the mountain being built of sharp, but not large, fragments of sandstone, piled by nature in a manner that I am sure would have excited Mr. Rendel's admiration. Up this, by aid of our hands, we climbed; but getting enveloped in a mist, we were brought to a standstill on a narrow shelf, where moss and lichens were growing and Tripe de Roche flourishing. Traces of reindeer were found, which I suppose resort here for food when the snow in the plains lays too deep. Occasionally through the mist we obtained a glimpse of the peaks to the E. and W. of us, which in this view showed a very steep face to the southward; I am therefore inclined to think the range is very narrow. After waiting a considerable time without any prospect of its clearing off, I had to relinquish our further ascent, fearing to lose all trace of our track. The aneroid showed 28·100, which, compared with the barometer on board, will give 2250 feet; I estimated the summit as 700 feet above us, but that was not one of the highest parts of the chain. We found our way back with some difficulty, and on the ridge where the tent was pitched, came upon a patch of red clay. I moved the camp to the north-eastward, hoping a clear day would give me another

opportunity for a visit; but a thick haze veiled everything, and I got on board on Saturday, without having obtained one of my principal objects, viz., an extended view to the north. Finding the ptarmigan were getting scarce about the house, I despatched Mr. Jago to our last camping place, whence he bagged and brought on board upwards of 20 dozen, besides what were consumed by the party during the week.

On Sunday, the 21st of May, all our invalids were discharged to duty, and the fact of having no one on the sick report had occurred so seldom previously, that I issued ½ lb. of pemmican and ¼ lb. of potatoes per man, and upon Her Majesty's birthday ½ lb. of pork and ½ pint of wine was issued. Pools of water began to make upon our floe, and I took advantage of them to fill up our water at once, fearing when the ice became more porous it would prove brackish. On the 1st of June the dingy was dragged on shore, as a stand-by for the shooting parties, in the event of the rush from the rivers breaking the ice away from the shore. Our deck-load this year was carefully arranged in small casks suited to our boats.

Mr. Jago brought back as the result of his second week's sport, fifteen dozen ptarmigan, and the third week ten dozen, with seventeen ducks and four geese. The boatswain and carpenter were sent out the following week, but the weather proving hazy, returned-empty handed. In attempting to establish a second shooting party to the westward, Halkett's boat capsized; fortunately both the men could swim, but we lost some provisions and ammunition. The punt was established as a ferry-boat, as the water had increased considerably, and in a strong breeze Halkett's boats could not face the sea. On the 19th of June the pinnace and cutter were hoisted in, and the eastern shooting party were directed to bring their tent back with them, as there was not only a broad gap of water abreast the ship, but the ice both to the east and west was flooded to the depth of 2 and 3 feet.

On Saturday the eastern shooting party returned, bringing with them fifty-seven ducks; but Mr. Jago, owing to a strong

breeze, was not able to cross until the following afternoon, when he brought sixty-seven ducks and two ptarmigan. The ice was much honeycombed between us and the land-water, so that, until the latter approached us nearer, I detained the shooting parties. In the course of the week the dingy was sent to the house, and brought away all except the frame-work, and one covering, which, being old, I left for the benefit of the natives. On the evening of the 1st of July a large party of the natives were seen coming towards the ship from the eastward, but owing to the difficulty of finding a road, either on foot or for the *oomiaks*, they did not reach the ship until half-past four the following morning. On one of the boys were several buttons, with an inscription: "Gone N.E. of Point Barrow *Investigator* August 1850, *Enterprise* August 1851, *Plover* at Port Clarence 1852, squadron with steamers searching N. and W. of Parry Islands 1852, depots of provision Refuge Inlet, Port Leopold, and Admiralty Inlet, in Barrow Straits." In a short time a printed paper, dated H.M.S. *Plover*, July 4th, 1853, Point Barrow, was produced; and gave us the information that our consort had not been heard of, and consequently she was most likely to the north of us, on the west coast of Baring Land, whence, in all probability, the bad season of 1852 had not released her. As we had met with a great quantity of ice about Cape Bathurst in 1853, it might happen that she had not made her escape last year. I therefore determined to open a communication with Captain Maguire as soon as the ice would admit a boat to proceed to the westward.

Our new visitors, forty-one in number, in two *oomiaks*, soon made themselves quite at home; they were not, however, so well behaved as our acquaintances of Victoria Land, showing a strong disposition to appropriate every article. They brought a good many fox and brown bear skins, but neither venison nor fish; these, however, they promised to return with, and produced three muskets, one of which had a date, 1850, on the lock; a few cartridges and some ball, both of which were highly prized, were given them, and a promise of more when they brought something in return.

During the time we were performing Divine Service they set out; and fearing their thievish propensity would not stand the temptation of our tent on shore, a party were despatched after them, and got to the edge of the ice just in time to save the oars, mast, sail, &c., of the dingy, which they had taken to their *oomiaks*. A thick fog set in, which prevented our watching their movements. The house had, however, caught their attention, and when the weather cleared off, we found no signs of it; fortunately all that was not intended for them had been removed, otherwise I should have had occasion to have recourse to harsh measures; it however showed the necessity of maintaining a watchful eye over their proceedings.

On the 5th of July, the day being clear, I left with three men, in order to select a position for a mark, and to obtain some observations for the elevation of the Romanzoff chain. We took with us Halkett's boat, which had been invaluable; but in consequence of constant use during the preceding years, was now become considerably worn and patched. On reaching the edge of the ice, and seeing that the shooting party had not paid any attention to the dingy's recall, and come off from the tent to us, we pushed off, intending to paddle across, the distance being rather more than a mile. We had not, however, gone far when a breeze sprung up, and a hole burst in our boat, fortunately a floe was at hand, on which we were but too glad to remain until the dingy came to our aid.

The snow having now cleared away, I had a good opportunity of seeing the country, and soon discovered that what on our arrival we had taken for the eastern bluff of Flaxman Island, was in reality the embouchure of the Canning. The river taking a westerly trend, confirmed our error, and it is my opinion now that the Staines is an outlet of the same, and Brownlow Point will be found a large island. The mouth of the Canning is half a mile wide, and apparently shallow, with sand-banks; in coming on shore we had to leave the boat three-quarters of a mile from the beach, and wade on shore, crossing one of the mouths into which the

river was divided, but never obtaining more than 2 feet of water. Although the day was fine the stream was not rapid. The flowers were out in all their beauty, and showed a variegated carpet of blue, purple, and yellow. The ice still remained packed upon the sand-banks to the E. and W., and in no place was there so much water as immediately opposite to the ship.

On the 8th of July we experienced one of the westerly squalls, which caused the thermometer to rise 6°, and produced great havoc in the ice at its edge. On the morning of the 10th it appeared sufficiently open off Point Brownlow to permit the whaleboat to get round it. We launched her into the water, and at noon she was provisioned for 29 days, and despatched under the command of Lieut. Jago for Point Barrow.

We bent sails and cables the following day; and on the 13th the natives, 16 in number, each in a *kayak*, returned; they brought very little with them for barter, and demanded a much larger price than I was inclined to give them. All however went off in a good humour; they gave us specimens of dancing and singing, and our play-actors, donning their pantomime dresses, created great amusement.

I got the names of several places along the coast, and have placed a query against the locality of which I am doubtful:—

| | |
|---|---|
| The Mackenzie | Imna? |
| Village between it and Point Kay | Pe-ock-chā. |
| Point Kay | Te-kec-rā. |
| Reef E. of Herschell Island | Ke-yuc-tā-zia. |
| Herschell Island | Ke-yuc-tā-huc. |
| Barter Island | Noo-nā-miaou. |
| Fishing station this side | Ac-but. |
| Village visited by me in the autumn | Noo-na-ma-luk. |
| About 7 miles S.E. by E. from the ship | Noo-woo-a. |
| Romanzoff Chain | Chud-loo-o-sak. |
| Canning River | Kook-Doak. |
| Flaxman Island | Kapagillok. |

| | |
|---|---|
| Between Point Barrow and Flaxman Island . . . . . | Chegea. |
| Point Barrow . . . . . | Noo-wook. |
| Beyond Point Barrow . . . | Ot-kia-mik-miot. |

On the 14th of July, the land-water being so close as to be reached without much labour, the boatswain was sent with the seine; but unfortunately mistaking the directions given to him, he missed the mouth of the Canning, and finding the beach too shallow tried a lake, but without success. As it was evident the pack about the ship would not hold long together, the tent was embarked.

## SECTION XVI.

### RETURN TO ENGLAND.

### 1854–5.

### CAMDEN BAY TO POINT BARROW.

ON the 15th of July the ice in the centre of the pool, which had been frozen ever since our arrival here, measured 4 feet 3½ inches, but it had wasted much more in many places, and there were several holes through it. At 2.30 p.m. the pack was in motion, and the ship drifting slowly to the eastward; the saws were got over, and the ship cut out of her dock, so as to take advantage of any opening; which occurred the next morning, when we cast off and made sail into the land-water, but were brought up off Point Brownlow, where the pack was resting on the shore, as well as upon Flaxman Island. In the evening the wind freshened from the eastward, and the floe we were fast to started half a cable's length, when it again brought up in 4 fathoms water. On the 18th the ice slackened off, but not sufficiently to admit of our progress to the westward. We employed the interval in getting on board some firewood, and again tried our seine, but with little success. A westerly squall occurred in the evening, raising the temperature 14°, which speedily dispersed the pack, and opened a promising lead towards Flaxman Island, which I only waited an abatement in the violence of the wind to take advantage of. At 1 a.m., however, the floe started, and we made sail, plying between the ice and the shore; in attempting to pass between the point of the pack and the shore, we got into our own draft, and were under the necessity of seeking into it, hoping to get hold of a grounded piece; which, after an ineffectual attempt, we succeeded at 7 p.m., but not until

we had drifted as far to the eastward as our winter quarters, and found part of our dirt-heap within half a mile of the place it had been deposited. An easterly wind sprang up shortly after 1 p.m. on the 20th of July, when we cast off; but in tending the ship one of our warps gave way, the ship fell into a bight into the floe, and we were detained a considerable time in extracting her. The delay was so far fortunate, that it enabled our Barter Island friends to pay us another visit; and we soon found out that they had several strangers with them, the chief of whom produced a paper, on which was written:—

"The printed slips of paper delivered by the officers of H.M.S. *Plover* on the 25th of April, 1854, to the Rat Indians, were received 27th of June, 1854, at the H. B. Company's establishment, Fort Youcon; supposed Lat. 66° N., Long. 7° 55′ W. (? 137°). The Rat Indians are in the habit of making periodical trading excursions to the Esquimaux along the sea-coast. They are a harmless, inoffensive set of Indians, ever ready and willing to render every assistance they can to whites.

"WM. LUCAS HARDISTY,
"Clerk in Charge.

"Fort Youcon, June 27th, 1854."

These people were entirely different-featured from the Esquimaux, and were clad in blankets, and wore as necklaces and ornaments through the septum of the nose, the *eye o quaws* (Dentalium), which are mentioned by Simpson in his narrative, and which form the currency on the N.W. coast of America. They were a quiet, well-behaved people, and I was sorry to turn them away somewhat unceremoniously; but the ship, having cleared the floe, began to move through the water at a rapid rate, which endangered the *'oomiak* coming in contact with pieces of ice; and they at length shoved off, loaded with several useful presents, and a tin cylinder containing information. They appeared, like the natives of Sitka and Vancouver Island, to place a value on some papers of vermilion, while our friends the Esquimaux

were much more intent on blue beads. It is no doubt from them, and most likely from the Youcon establishment, that the latter obtained the firearms, as each of the men who visited us on this occasion was armed with a musket.

At 8 p.m. the E. end of Flaxman Island bore S.S.E. 4 miles; but we now found the pack too close in upon the sandbanks to permit of our passing between them, and were compelled to take the most open lead to seaward, being brought up at 11.30 by a pack much water-worn, but apparently not yet moved from its winter position. The ship drifted in it towards the morning slowly to the westward, and, the fog clearing away so as to afford us a view of the lanes of water, we made sail at 1 p.m. on the 21st of July, and forced our way from one hole to another until 2 a.m., the 22nd, when the wind chopped round to the westward, and, the ice being too close to turn to windward, we made fast to a grounded piece 20 feet high.

In the course of the forenoon the ice opened sufficiently to admit of a boat reaching the reef, and a mark was erected on it, with information for Lieut. Jago, in the event of our passing him in a fog. The weather remained too thick to see our way until the afternoon of the 24th, when we very soon got into a comparatively clear sea, which continued until 8 p.m., when the wind changing to the westward, and a close stream, prevented our making any progress; and after tacking to and fro for four hours, and gaining no ground, I made fast to a piece at midnight; but it proved afloat, and it was not until 3 a.m. that we got alongside of a piece that remained firm: fearing the floe would start, I kept sail upon her until 8 a.m., when, the breeze increasing, we furled sails. In the first watch it moderated sufficiently to send a boat ashore and erect a mark, which was done on what I think is Return Reef. During the 26th of July the wind again freshened from the S.W., and started our floe at 9, when we cast off, and grappled another; but it shortly broke up, and it was not until 3 p.m. that we got the ship secure to a solid piece.

On the 27th the wind went down, of which I took advantage to obtain the dip and variation on the floe. At

5 p.m. a south-easterly wind sprung up, on which we cast off, and nearly lost two of our men by a floe capsizing. One was fortunately near enough to receive assistance by a rope from the ship, and happily for the other a sufficient part of the floe remained steady enough for him to maintain his footing. Neither could swim, and, encumbered as they were by boots and heavy dresses, their escape was at one time very doubtful. We turned to windward round a grounded point, and then pushed through a loose pack into a sea-stream, in which we bade fair to make a straight course for Jones Island; but the wind chopped round again on the morning of the 28th of July, and, after in vain endeavouring to work to windward, we made fast at noon near the weather edge of a large floe. The westerly wind continued throughout the 29th, and, some loose ice coming down, we experienced some pressure; but by getting the saws over soon cut her free, and hove her into a better dock. On the 30th the wind fell, but the ice continued to go fast to the eastward. At noon several natives were seen coming to us from the westward, and, on their arrival, we soon found out from their dress that they were from Point Barrow. Several printed notices from the *Plover*, dated the 1st and 2nd inst., were produced, and upon the back of one of them was the following information from Lieut. Jago:—

"*July* 17*th*, 2 a.m.—Encamped on the ice, not being able to get along, either in shore or off. The boat is greatly strained, and I think, if we get much more launching, we shall not be able to return till we fall in with some ship to repair her.

"C. T. JAGO,
"Lieut."

"Drew Point, *Enterprise* boat. There are three tins of pemmican at Berens Point."

They also brought us sufficient venison for a general issue, and some geese. They appeared perfectly familiar with my name, and from one of the boys, who had apparently been to sea in the *Plover*, and could speak a few words of English, we got some confused information of his having been at Port

Clarence. A considerable portion of the *Illustrated London News* for May, 1851, containing, among other things, an account of the opening of the Grand Exhibition, was produced and eagerly perused; and a fragment of another newspaper, dated October, 1852, gave us just glimpse enough into the transactions of the civilised world to render our anxiety to hear what had been done during the last three years all the keener.

A breeze sprung up from the eastward, increasing sufficiently at 6 p.m. to warrant an attempt to push through the pack; we cast off, and, after some trouble, got into a lane of water by midnight, and ran along the southern edge until 4 a.m., when the wind headed us, and the space becoming too confined for working, together with hazy weather, induced me to make fast at 8 a.m., 31st of July, to a large grounded floe, in 6¼ fathoms. When the weather cleared up at noon, the land was in sight to the southward, but at a considerable distance; the pack between us and it and to the westward looked very unpromising, there being but few holes of water in it.

On the afternoon of the 1st of August, the wind freshened to a gale, and soon began to make havoc in our pack; the floe we were fast to was a very heavy one, and remained firm throughout the breeze, which lasted without intermission till the afternoon of the 4th, when it hauled to the north, and the land-water was now quite close to us. On the morning of the 5th we cast off, and stood in to the southward. The water deepened immediately on leaving the floe from 5¾ to 9 fathoms, from whence it shoaled gradually to 5, when we were about 2 miles from a low sandbank, to the west of Jones Island. Finding we were making little or no progress, I sent the boat to erect a mark on it. We continued beating to windward between these sandbanks and the ice without gaining ground, until the afternoon of the 6th of August, during which time whales were very numerous. An easterly wind, to our great comfort, sprung up at 4 p.m., and we shaped our course for Cape Halkett. In the morning watch of the 7th, whilst rounding a point of ice, we passed

suddenly from 3½ to 2½ fathoms, but by hauling out at once to the northward, escaped without touching the ground. Towards the afternoon the wind freshened, and, having a clear open road, we made the most of it, and reached Point Barrow at 1 a.m. on the 8th of August. We soon made out the house, but seeing nobody on shore I hove to, and was about to send a boat, when we saw the first whaler coming off under sail. Mr. Jago was soon on board, and gives the following narrative of his proceedings:—

### JOURNAL OF WHALE-BOAT.—CAMDEN BAY TO POINT BARROW.

"*July* 10*th.*—Received orders from Captain Collinson to proceed to Point Barrow with the first whale-boat and six men, in order to communicate with H.M.S. *Plover*. Left the ship in winter quarters in Camden Bay about noon, and at 1 p.m. started from the ice in the land-water; light airs from the eastward with cloudy weather; 4 p.m., brought up by the ice being close to a shingle bank, but as there was water inside I had the boat launched across and proceeded; 7.50, rounded Point Brownlow; 9.30, finding the ice close and newly broken off, hauled the boat on shore, and pitched the tent about 8 miles past Point Brownlow. Light winds from the northward and eastward and cloudy.

"*July* 11*th.*—4.20 a.m., started, with light winds varying from N. to E., reeving and launching amongst close ice; 9.30, unloaded the boat, and launched across Lion Reef; 10, proceeded under sail to the westward. Fresh wind from the eastward and thick weather. Passed inside Foggy Island.

"*July* 12*th.*—5.30 a.m., off Point Anxiety. Ice close to Point—launching over do.; noon, the ice still remaining close, and the weather becoming thick, hauled the boat on shore and encamped.

"*July* 13*th.*—4.30 a.m., started, launched the boat over heavy ice until 11 a.m., when we got into the open water of Yarborough Inlet; light wind from S.E. with fog; 4.30 p.m., came to a point, where the ice was pressed up on the

beach. Rounded Point Heald at midnight. Water shoal, boat very leaky. Saw the Franklin Mountains.

"*July* 14*th.*—7 a.m., landed on a reef for the purpose of repairing the boat. At noon started again, with a light wind from the eastward and cloudy; current going to the west; 1 p.m., passed Return Reef; sailing and poling to the westward between the reefs and the shore; ice close to the reef on the off shore side; 11 p.m., wind light and variable from W.N.W. Ice setting to the eastward.

"*July* 15*th.*—6.30 a.m., landed at Point Milne; found the ice close to the shore; 10.30, started, launching the boat over ice; 0.30 p.m., got into open water; wind westerly; under sail, working to windward; observed a mark erected on Point Berens; landed to examine the same, and found it was made by a party from the *Plover* in 1854, with three tins of pemmican buried 10 feet N.E. of it; 7 p.m., started again, wind hauling round to the eastward through north, shaped a course across Harrison Bay; 10 p.m., landed on a reef about 10 miles to the westward of Point Berens to examine a pole, but found only marks of encampments. Buried the following articles:—Halkett's boat, a sledge, boat's rudder and slings, 56 lbs. of damaged bread in a black bag. 11 p.m., left the reef; light wind from eastward with thick fog; passed through a few streams of ice.

"*July* 16*th.*—Found the ice getting close, kept the boat in shore. At 7 saw the land; noon, rounded a point, water very shoal; wind fresh from eastward, with occasional showers and fog. Some huts seen on shore, also some *oomiaks* coming off. Standing to the N.W. through streams of ice.

"*July* 17*th.*—Fresh breezes from eastward and cloudy; 2 a.m., encamped on a floe of ice, about 3 miles off shore. Some Esquimaux from Point Barrow visited us, with intelligence from the *Plover*, which had wintered there, dated 2nd of July, 1854. Got under weigh, launching the boat over ice into land-water, which we managed to reach by 10 p.m; 11.30, encamped on the land. Thick fog, with fresh breeze from the eastward, but inclined to go down.

"*July* 18*th.*—9 a.m., started, with light winds from eastward and cloudy, sailing and poling along the land in shoal water; 5.30 p.m., the ice close into the land, but slack off shore; went on shore; 9.30 p.m., started again, with a fresh breeze from the S.W. and cloudy, which drove the ice off shore.

"*July* 19*th.*—5 a.m., encamped. Light wind from S.E. and cloudy. Started at 5 p.m., sailing and poling along in shore. Ice to seaward thick and heavy.

"*July* 20*th.*—Light winds from S.W. and fine weather, current setting strong to the eastward; 1 p.m., light winds and variable, with thick fog, running to the westward in about 2 feet of water, and no land seen; 10.30 p.m., overcast with rain. Encamped on Cape Simpson.

"*July* 21*st.*—Fresh breezes from westward, with heavy rain all day. Remained encamped—current setting to eastward.

"*July* 22*nd.*—5 a.m., weather clearing, started—light winds from W.N.W. and cloudy—pulling and tracking the boat to the westward; 7 p.m., passed Point Tangent, with the ice close in upon it. Found marks of travelling parties from the *Plover*; 10.30 p.m., encamped in Dease Inlet, thick fog, current setting to the eastward strong.

"*July* 23*rd.*—6.15 a.m., started, sailing and launching amongst ice to get into the open water of the opposite shore of the inlet. Light wind from the N.E.; 3 p.m., rounded Point Christie; 5.30 p.m., encamped on Point Charles; found the ice pressed close upon it, but water outside. Wind light from S.E. Midnight, ice slackening.

"*July* 24*th.*—1 a.m., started with a breeze from S.W.; 4.20 a.m., arrived at Point Barrow, and encamped about 1½ mile S.W. of Esquimaux village, the bay being filled with ice. Found a house here erected by the *Plover*—went to it, and learnt, from intelligence left, that the *Plover* had sailed on or soon after the 20th inst. for Port Clarence. Strong breeze from west with rain. 7 p.m., shifted down to the house.

"*July* 25*th*, 26*th*, 27*th.*—Examined the *caches*, three in

number, of provisions left by the *Plover*. Overhauled the boat, and found her so much damaged, that I thought it advisable to remain where I was, till I could communicate with a ship to get the necessary articles for the purpose of repairing her.

"*July 28th.*—During our dinner found the Esquimaux had disturbed one of the *caches*, and ate about 20 lbs. of bread.

"*July 30th.*—0.30 p.m., observed a sail to the S.W. about 5 miles off, but, as a strong breeze from N.W. was blowing at the time, she was hull down before we could get ready to go off to her.

"*August 8th.*—Observed H.M.S. *Enterprise*. Preparing to rejoin her. 1 a.m., shoved off from the shore, and at 2.30 a.m. rejoined the *Enterprise*. Party all well. While on shore at Point Barrow, having occasion to go to one of the *caches* for provisions, and finding that they were getting partly damaged in the bottom of the tins and casks, I had some of them placed in and about the house. A white ensign that was placed on a staff at Point Barrow was missing. I think it must have been stolen by the natives.

"C. T. JAGO, Lieutenant."

## POINT BARROW TO PORT CLARENCE.—FINALLY LEAVE THE ICE.

As soon as the boat was hoisted up we bore away; but, shoaling our water at 2.30 to 5 fathoms, I hauled out to the north, when it speedily deepened, and we were fairly round the point at 4 a.m.; and by noon were abreast of the Sea-horse Islands, and lost sight of the ice; being 1164 days since we had made the pack edge in 1851, in which period 38 days only occurred during which it was not in sight. The maximum temperature of the air during the same period was + 63°, the minimum − 53°, the mean + 5°. The average number on the sick-list is as follows:—

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| From July, | 1851, | to June, | 1852 | = | 3·35, | or per cent. | | 5·5. |
| „ | „ | 1852 | „ | „ | 1853 | = 3·62 | „ „ „ | 6·0. |
| „ | „ | 1853 | „ | „ | 1854 | = 3·48 | „ „ „ | 5·85. |
| | | | | Mean per cent. | . | . | . | 5·78. |

With deep gratitude to Almighty God for having preserved us, we experienced with unfeigned pleasure the rolling swell of the open ocean, and bade adieu without regret to the cares of ice navigation.

During the night of the 9th of August the current swept us down upon the shoals off Icy Cape, which, being low, is a very awkward place to round, and the banks were not as usual buoyed by grounded icebergs; in fact, neither in 1850 nor 1851 had we seen the sea so clear of ice as it appeared this season.

The whale-boat was hoisted in to repair, which she much required, both garboard streaks being split in several places; boats in future equipping for this service should be fitted with stout bilge pieces, which would have the effect of strengthening the floor timbers (several of which were broken), as well as protecting the bottom from the ice. We got up to Cape Lisburn at midnight, but, the wind failing us, did not reach Point Hope until 8 p.m. on the 10th of August. Not seeing the post up, or any natives on the point, I did not think it worth while to lose a mile or two by communicating.

On the 12th of August four sail were seen, it being three years and one month since the last seen had been reported to me; and at noon we again entered civilised society, by communicating with the *John* of New Bedford, and received the gratifying intelligence that the *Investigator* had been reported upon the eastern side. The information was, however, very vague and unsatisfactory; so, in hope of obtaining something more decisive, we sent on board the *James Andrews*, the captain of which vessel came on board, his boat afterwards bringing a welcome supply of pumpkins and potatoes, together with newspapers. He corroborated the report that the *Investigator* had communicated with the Eastern expeditions, and thus relieved me of a load of anxiety; and also told me I should find the *Trincomalee* at Port Clarence. In return for his kind present and welcome intelligence, I strongly recommended him to push up to Point Barrow, the ice being remarkably open this season, and whales numerous. He thought the

risk very great, and was doubtful, but I endeavoured to assure him that by leaving in the course of the first week in September he would be in time to avoid the gales at the commencement of winter. After he had left, another captain came on board with letters for the southward, and we made sail before a light wind, finding ample occupation in extracting all the English news from the American papers.

On Sunday, the 13th of August, thanks were returned to Almighty God, during Divine Service, for having protected us through so many dangers, and a hope that, if preserved to return to our country, we might be endowed with grace to have a thankful remembrance of His mercies. Our fair wind left us entirely on the morning of the 14th, and we worked up along the American shore, crossing the bank which stretches northerly from Cape Prince of Wales in 4 fathoms. Towards the evening the huts of *Kingaghee* were visible, and a large fleet of *oomiaks* (42 in number) put off, the majority of which ran along in shore to the northward, a few only altering their course to communicate. It was therefore, in all probability, the autumn migration of the Schesmaroff and Hotham Inlet people. They had nothing but furs and walrus teeth for barter. Rum and brandy were, I regret to say, the articles most coveted in exchange.

The wind failed us altogether the next day, and after losing some ground, being tantalised by cats'-paws, we came to with the kedge in 13 fathoms, and found the current setting N. by E. at the average rate of eight-tenths of a knot per hour. A south-easterly wind sprung up at 2.30 a.m. on the 16th, on which we weighed, but it died away towards noon, when we again came to in 29 fathoms. A fine breeze, although foul, occurring at 2, we tripped our anchor and made sail, but finding we made little progress we crossed over the bank, and found slack water inside of it. On reaching the Cape we crossed its southern extremity in 3½ fathoms, and stood out to the Diomedes in the hope of a slant enabling us to weather the Cape. We were not, however, so fortunate, and, the southerly winds continuing, we performed the same thing day after day, working up inside the shoal until we reached

the Cape, and then losing all we had gained in stretching across the strait; so that it was not until the morning of the 21st of August that we succeeded in doubling it, and had therefore a much longer time than we had calculated upon to con our news, the small fragments extracted only increasing our desire for more information. Before dark we made out one sail at an anchor in Port Clarence, and came to alongside of her at 10.30. No boat coming on board, I was about to send to her, when one was seen, and on coming alongside I found in her Captain Trollope (H.M.S. *Rattlesnake*), who had taken us for a whaler, and it was some time before he was really convinced we were the *Enterprise*. Unfortunately we found the *Plover* had sailed for Point Barrow two days previous, and must have missed us in a fog; while the *Trincomalee* had only departed that morning for the southward. After keeping up an animated conversation until 2 o'clock, in which he obtained an epitome of our cruise, and I gained an insight into the changes which three years had produced, we parted, with the understanding that, as soon as the *Enterprise* was completed to three months' provision, she should proceed to Point Barrow so as to ensure the recall of the *Plover* (as I could not trust to the chance of the whale ships going there, or to their falling in with her, and unfortunately Mr. Jago left the house without depositing a notice that the ship had passed); while the *Rattlesnake* was to convey the news of our safety to San Francisco with all despatch.

## Return to Point Barrow.

We weighed at 2 p.m. on the 22nd of August, and ran out before a north-easterly breeze, leaving Captain Trollope to embark the provisions and stores which had been deposited on shore. On opening the straits we found an uncomfortable sea running, which, however, gave us more hope of overtaking our object. With abundance of newspapers, and the detail of the Eastern expeditions to contrast with our own adventures, we had ample occupation. A sail hove in sight the following morning, but did not prove

to be the one we were in quest of; and at noon, owing to the uneasy sea, the martingale strop parted, and we lost our jibboom. During the night blue lights and rockets were let off, in the hope of attracting the *Plover's* attention. From the *Rattlesnake* we obtained 16 dozen of porter, which was issued at the rate of half a bottle per man per day, and proved highly acceptable.

The wind shifted to the S.E. on the morning of the 26th of August, and we ran past Point Hope, and were abreast Cape Lisburn at midnight. On the 28th we made the ice, in lat. 71° and long. 159°, and ran along the pack edge, which took an easterly trend. At noon Cape Smyth was in sight, and at 3 we exchanged numbers with the *Plover* at anchor under Point Barrow. At 7 Captain Maguire came on board with our letters and despatches. He had arrived in the morning, and learnt from the natives that the boat had been there, and then, seeing the whale ships off the point, he sent to them for information, and had received authentic intelligence of our return, one hour previous to our heaving in sight. The whale ships, I was glad to hear, had been successful. After a most interesting conversation with Captain Maguire, I stood off for the night instead of anchoring, both being anxious to read my letters, and not liking the look of the anchorage; and renewed once more the pleasure of hearing from and of those near and dear to me.[35]

[35] Extracts from Private Letters.

"*Camden Bay, July* 9, 1854.

"That similar tidings await me, and the fact that they are within a month's grasp, and that probably within that period I shall learn whether it has pleased the Lord to remove from this world any more of those who are so dear to me, utterly prevents my attempting anything like a narrative."

"*Port Clarence, Aug.* 22, 1854.

"Those only know whose hearts are so deeply interested in each other's welfare, the thralling moment when the veil is about to be withdrawn, and your hopes and fears are vested in the breaking of a seal."

The commander of the *Enterprise* had been enviously noted throughout his service for his constant home correspondence, and he now received

from the *Plover* a large share of those anxious delights that come from the opening of a budget of letters from a far home. During the whole of that three years' disappearance from all outward ken, the never-failing mother had not ceased to write her monthly despatch to him, casting them, as it were, upon the waters in the firm hope that some of them would find the *Enterprise* somewhere. And her care was rewarded by his receiving at Point Barrow the rather troubling joy of upwards of thirty letters from home; happily concluding, "all well."—[ED.]

When morning broke a thick fog enveloped us, which lifted at 8, and enabled us to see that, the wind being directly into the harbour, the *Plover* would not be enabled to warp out; and, as it admitted of our shaping a course for Icy Cape, I determined not to wait for her, but started away to the southward: the wind fell light, so that it was the morning of the 31st before we lost sight of the ice, nor did we reach Port Clarence until the evening of the 8th of September; but I believe the intervening period did not pass heavily with any one, all thoughts being occupied with the intelligence from home. On the 9th we commenced wooding and watering. The *Plover* and an American whaler arrived in the afternoon, and the following day we began to take provisions from her, and embark a *cache* of fifteen casks of pork. Captain Maguire turned over for our use six live pigs, brought up by the *Trincomalee*, and a quantity of potatoes, which gave our people several fresh meals. The natives brought off venison and fish; and, what with porter and other small stores sent out by the Admiralty for our use, we fared sumptuously.

Our theatrical performers being desirous to show their skill, a performance took place on Tuesday, the officers and ship's company of the *Plover* attending; the "Birthday" and "Beggar's Opera" were selected, and went off with great *éclat*.

I renewed with Mr. and Mrs. *Kaimoki* my acquaintance; and found the passage to *Kingaghee* which they had taken in the *Enterprise* three years previously was still fresh in their remembrance. *Chimuak* was dead, and I was introduced to *Omatoke* as his successor. The *Plover's* sails in the cellar of the house had proved too great a temptation, and had been carried off in the interval of the *Rattlesnake's* departure and

our return: by the interference of the two chiefs they were brought back, but unfortunately were already cut up and ruined. *Kaimoki* was established in possession of the excellent house built by the *Rattlesnake*, which I hope will be the means of preserving it from being pulled to pieces, and also be a protection to the *Herald's* pinnace, which, with the gear complete, was left on the beach, for the benefit of any shipwrecked crew. Being desirous of adding an *oomiak* and *kayak* to the two specimens I had already got for the British Museum from Cambridge Bay and Barter Island, Captain Maguire concluded a bargain with *Omatoke*, giving, in lieu of the former, one of the double-barrelled carbines supplied to the *Plover*. This, it appears, was the price given by Captain Moore to *Kaimoki* for one before.

## Leave Port Clarence for Hong Kong.

Both vessels were ready for sea on the 14th of September, but a southerly wind detained us until the morning of the 16th, and all, I think, were glad to have a little more communication before we started. We had light winds; but at midnight, having reached half-way between Point Spencer and King Island, Captain Maguire left us, and the *Plover* parted company for *Oahu*.

The wind drew round to the northward, enabling us to leave King Island to the southward: in the evening it fell calm, and, springing up towards night from the S.W., we made but little progress.

As the skid boats interfered very much with our observations for variation, a platform 6 feet above the deck was made for the Azimuth compass.

On the 20th of September we were off the N.E. point of St. Lawrence Island, which is a steep bluff; but a little to the S.E. of it is a low gravel spit, on which are numerous huts; we passed about three miles from the huts in 15 fathoms water. The 180th meridian was passed on the 23rd, when the date was altered to the 24th, so as to assimilate our time with that of the Eastern Hemisphere.

On the 29th of September we had a distant view of the island of *Attooi*, which rises suddenly from the sea, and attains a great elevation.

The weather continued unsettled after entering the Pacific, until the 14th of October, when in lat. 38° we got the N.E. trade. The winds previously holding to the west, prevented our getting through the Kurile Islands into the Sea of Okotsk; and, as we were now to the southward of *Matsmai* Straits, I gave up all idea of getting into the Korean Sea.

On the 16th and 17th of October we felt the effect of the Japanese current, the difference between observation and reckoning amounting to 43 miles in the 24 hours, thus corroborating the account given in Captain Cook's voyage. The temperature of the sea fell on the latter day to 66°, and rose again on the 18th to 74°. By shaping a course more to the southward, we ran out of the current until the 21st of October, when South Island, or *Onosima*, was seen; and, being compelled to pass west of it, we found that we had again got under the influence of the coast stream, our observations the following day showing a set to the N.N.E. of 51 miles in the 24 hours. South Island is not above 3 miles in circumference, rising suddenly from the sea to the height of 500 feet, and is densely wooded. With our glasses on the north and west sides we could detect no signs of inhabitants, but on rounding the island after dark a light was seen more than half-way up the hill on the south side. The northerly set carried us in sight of *Futsizio* the following morning. It rises in conical peaks to the height of 2000 if not 3000 feet. The large island has a considerable quantity of level ground, not much elevated above the sea; but the peaks being enveloped almost constantly in a mist, prevented our obtaining all the observations I could have wished. We, however, place South Island, or *Onosima*, in 32° 20′ N., and 139° 54′ E.; and *Futsizio* in 33° 7′ N., and 139° 42′ E. By standing to the eastward we got out of the current, passing through a strong rippling between 8 and 9 p.m., and experienced a set of 18 miles only to the N. by E. during the following 24 hours. It will, therefore, most probably be found to have as well defined an edge as

the Gulf Stream. The set of the currents will, however, be seen by reference to the following page.[2]

See Note 2, METEOROLOGICAL OBSERVATIONS, p. 41.

On the 26th of October, at 2 a.m., in lat. 28° 15′ N. and long. 130° 10′ E., lights were seen to the northward; but whether they were on shore, or belonging to fishing vessels, a squally and rainy night prevented our determining. We continued to run on 25 miles further, when, just as day broke, we were brought up by the land, and compelled to keep to the southward, the loom of it extending to the E.N.E. as far as the limit of vision from the mast-head. We then ran along the coast at a distance of from 2 to 5 miles until noon, obtaining no bottom with 60 fathoms. Then in lat. 27° 39′ N. and long. 129° E. the land turned to the north. Several patches of cultivated ground were seen as we coasted along, and near the south point three populous villages with boats on the beach were seen. In the afternoon two low islands were seen to the southward, and a conical rock to the north. We had therefore traced the land for 75 miles, where on Arrowsmith's chart (corrected to 1844) Crown Island only appears. They do not appear to form one island, as many indentations were seen; but they are most likely all connected by coral reefs, the water being discoloured between them. In the course of the day an American vessel passed us, bound to the northward, and upon my arrival at Hong Kong I learnt that this is now the usual passage from the Pacific into the Chinese Sea by the Shanghai trade.

On the 29th of October made the island of *Haitan*, having experienced a northerly set since entering the China Sea, thereby showing that the equatorial current, on striking the Philippine Islands and Formosa, takes a northerly trend, sometimes running at more than 3 knots per hour, and that in the face of the N.E. monsoon. At noon on the 31st we passed Pedro Branco, and anchored at the entrance of the *Lyeemun* Passage at midnight. Weighing at daylight on the 1st of November, we ran through the *Lyeemun*, and made our number to the *Winchester*, who had some difficulty

in making out what we were, as the signal-books had been changed, and the number we hoisted corresponded with that of the *Endymion* in the new books. The wind falling light, Sir James Stirling sent the boats of the squadron to tow us to an anchorage, and kindly greeted our return to civilised society with three cheers. We were soon in possession of the news of war with Russia, and that the Admiral with the squadron had just returned from Japan.

## Leave Hong Kong for Cape of Good Hope.

We remained in Hong Kong until the 18th of November, and then, embarking twenty invalids from the hospital ship, we made sail for England. The relaxation and run on shore did our men more damage than all the exposure to the northward; our sick-list, from none on our arrival, soon amounted to nine, besides the invalids, several of whom where in the last stage of dysentery; and during our passage down the China Sea, four of them, and Mr. Turner (who had been appointed clerk in charge from the *Encounter*, under the hope that he would be well enough to perform the duty on the passage home) fell victims to the disease.

We passed to the east of Natunas, and then shaped a course for Gaspar Strait; but, getting baffling winds with an easterly set, could not fetch to the westward of Billiton. I therefore ran through the Carimata Passage, not thinking at this time of year to find the western monsoon so violent in the Java Sea; but, after attempting to beat to the westward for three days, which the current and the ragged condition of the copper on our bottom prevented, I bore away for Bali Strait, passing the east end of Madura on the 8th of December. Owing to light winds and strong north-easterly current, we did not reach the entrance to the strait until the 12th, when, having obtained a pilot, we beat through the narrows, and, after anchoring for the tide, reached Bango-Wangie Roads at 8.30 the same evening.

This place is much frequented during the monsoons, the Dutch vessels from the Spice Islands, Borneo, and all the

ports on Java east of Batavia, calling to fill their water, and take their final departure for Europe. There is a convenient jetty for landing, and an abundance of supplies.[36]

[36] CYPHER NOTICES IN THE 'TIMES.'—Before he left home the captain of the *Enterprise* devised a simple mode of communication with his family, which he would be more likely to get wherever he happened to touch during his uncertain voyage than by the ordinary private letters, which must necessarily be sent by special vessels to fixed points. This was by putting a cypher notice in the *Times* newspaper on the 1st of every month, as that was a publication more likely to be met with all over the world than any other document, public or private—a mark of confidence in that leading member of the British press, which was considering all things, fairly justified by the result.

The cypher employed was a very easy and a natural one for a sailor; it was simply using the ordinary signal-book of the Royal Navy, substituting letters of the alphabet for the numbers. Thus a vocabulary was at once provided, accessible only to certain persons, and the key of which was known only to himself and his relatives. From the time of his departure until his arrival in England in 1855, an advertisement in this cypher was regularly inserted in the *Times* on the 1st of every month, giving him a brief notice of the welfare of his family.

Unfortunately, his peculiar movements prevented his receiving any benefit from this care and forethought until he finally re-issued from the ice in 1854. In 1850 he was within reach of ordinary letters, and in 1851 he disappeared from sight and knowledge virtually for three years. It was on his way home, at the little known port of Bango-Wangie, in the Straits of Bali (S. of Java), that he first benefited by the invention; and there he found four advertisements at once, giving him the latest news of his friends; an evidence of the diffusion of that renowned paper which would have been both gratifying and, perhaps, surprising to its managers had they known of it.—[ED.]

Leaving Bango-Wangie on the 17th of December, we got out of the strait without difficulty, but experienced light winds with a strong easterly set until the 24th; when, in 10° 34′ S. and 117° E., we obtained a southerly wind, with a westerly current of at times nearly 2 miles per hour. The temperature fell below 80° on the 1st; during our passage down the China Sea and in the Bali Strait it stood frequently at 88°, proving very oppressive, not only to the invalids, but also to our own people.

On the 16th of January we lost one of our shipmates, J. E. Davidson. He had been suffering under a pulmonary

complaint for the last two years, and the surgeon more than once had despaired of his life; but on our egress from the ice he rallied, and was able to perform day duty. On arrival at Hong Kong, with a caution both from the surgeon and myself, he was allowed to go on shore during the daytime; but, unable to withstand the temptation, he fell into excess, which weakened him so that he was unable to stand the change of climate.

On the 20th we had to deplore the loss of another, William Simpkins, A.B. In the course of last winter he had an awkward fall, while bringing a piece of ice on board, which crushed his hand, and deprived him of the use of his fingers for a considerable period. He had, however, been able to perform light duty, but after leaving Bango-Wangie symptoms of dropsy appeared, which eventually carried him off.

On the opposite page will be found the daily number on the sick-list throughout the year 1854,[26] the mean being

See Note 26, Appendix: HEALTH.

3·18 or 5·4 per cent. The small number will appear the more surprising when it is recollected that we had no opportunity of invaliding men or sending them to the hospital, all of which greatly diminish the number of sick in the general service. In this case 3, if not 4, of the most sickly would have been discharged at the commencement of the year; and all tends to show how wonderfully man is adapted to all climates, as well as the value of men being removed from temptation; the average number daily on the sick-list in October being 0·48, while in November it increased to 3·70, and during December to 7·23.

On the 29th of January, in 33° 30′ S., and 30° 30′ E., we passed through a line of foam with sea-wrack, trending N. by W. and S. by E., but experienced very little current, until we reached 34° S. and 27° E., when it set to the W.S.W. 88 miles in two days. In 35° S. and 24° E. it set to the S.E. at the rate of 1 mile per hour; and on the 4th of February we had a distant view of the coast of Africa, experiencing a north-easterly set of 1 mile per hour. On the 5th we passed

Cape L'Agulhas, and shaped a course one point and a half to the south of the Cape of Good Hope. But, the wind proving light, this was not sufficient for the indraft of False Bay, as in the course of the following forenoon we found ourselves off Danger Point, and only 6 miles from the shore.

While here a steam vessel from the eastward passed, and on communicating gave us the unexpected intelligence of Dr. Rae's discovery of the relics from the missing ships.

No doubt, had we possessed the means of understanding the natives in Cambridge Bay, we should have got a clue from them which would have induced me to pass over to Boothia and examine its western face, instead of examining the east coast of Victoria Island. Mr. Arbuthnot (as will appear in the latter part of the first volume of my journal) seemed to think they indicated a ship being to the eastward of us; but, as the chart they drew at his request did not at all accord with what we afterwards found on our spring journey, I thought the whole information erroneous, more particularly as but two articles were seen in their possession which could have come from a boat or vessel; these I paid a high price for, and every encouragement was given to bring in more.[29]

See Note 29, VICTORIA STRAIT, p. 259.

On a careful consideration of the circumstances I am now inclined to think that the vessels, after being carried away from Beechey Island in the spring of 1846, were never again liberated from the pack, and thus carried into Peel Inlet, its hummocky nature and frequent disruption preventing their having any communication with North Somerset or Cape Walker; that, on the provisions becoming short, the ships were abandoned somewhere in the vicinity of the magnetic pole, and the crews made for Back's River, when the rough nature of the ice only admitted the strongest of them reaching Simpson Strait, and that, at too late a period to accomplish their journey through the Barren grounds, previous to the migration of the deer and other game; and that they remained on the sea-shore in the hope of getting fish and seals, or food, from the Esquimaux.

The paucity of European articles found among the tribe by us, leads me to the belief that the Esquimaux themselves have not reached the vessels, otherwise the materials from them would have spread in the course of three years in greater abundance along the coast.

The necessity of keeping both sleighs together, owing to the difficulty of the road, prevented my detaching one, as was my original intention, to the Boothian side, in which case their trail would most probably have been fallen in with. This is so far unfortunate, as with our means we should have been able thoroughly to investigate the locality in the summer of 1853.

We arrived at Table Bay at 6 a.m. on the 7th February, and in the course of the day I went to Simon's Bay to wait on Commodore Trotter, calling at the Observatory on my route, where my arrival created great astonishment.

On the 9th the magnetic instruments were compared at the Observatory, and I obtained from Mr. Maclear (the Astronomer Royal) upwards of 200 corresponding observations for our moon culminations, which, considering that we were two years without nautical almanacs, and were upwards of 100° apart in latitude, and nearly half the globe in longitude, is a remarkable number.

The new transit circle had just come into play, and will add greatly to the utility of the Observatory, about which the shrubs and trees have now sprung up luxuriantly, affording a pleasing contrast to the barren appearance it presented in 1829, when I first visited it.

### LEAVE CAPE OF GOOD HOPE FOR ENGLAND.

During our stay in Table Bay we had many visitors, notwithstanding the motion, and, having given all our men another run on shore, the ship was swung for local attraction on the 17th February, but from lack of wind we were unable to put to sea until the following morning, and then narrowly escaped the Whale Rock in a fog.

On the 28th we arrived at St. Helena, and found, much

to our astonishment, that the *Sitka*, with the *Plover's* ship's company, had sailed for England only the previous Saturday.

Leaving St. Helena on the afternoon of the 3rd March, we reached Ascension at 1.30 a.m. on the 9th, having, I regret to say, lost another of our shipmates, J. Wiggins, A.B., on the passage; he was a great favourite with everybody on board, and his loss much lamented.

At Ascension the magnetic observations were made, and the ship swung, and, having received eight turtle from Capt. Kitchin, we sailed the following day, crossed the line in 19½° W. on the 15th, and made the Island of Corvo on the 8th of April.

On the 14th, in lat. 45°, and long. 16°, we caught a north-easterly wind, which continued, with little intermission, until the 25th, when it ceased for a few days, and then sprung up again with greater fury.

On the 26th we fell in with the wreck of a lower mast with the topmast attached, in lat. 49° 6′ N., and long. 12° 43′ W., apparently but a short time in the water.

The wind continued strong, and the ship, in consequence of the rough state of the copper from collision with the ice, made but little progress to windward, so that it was not until the 5th of May that we got a sight of Old England.

END OF THE JOURNAL.

# TABLE I.

## Prevalent Winds by Nos. of Days. H.M.S. Enterprise.

| | Walker Bay. 1851–52. 71° 35′ N. 117° 39′ W. | | | | | | | | | | Cambridge Bay. 1852–53. 69° 3′ N. 105° 12′ W. | | | | | | | | | | Camden Bay. 1853–54. 70° 8′ N. 145° 29′ W. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | Vble. | Calm | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | Vble. | Calm | N. | N.E. | E. | S.E. | S. | S.W. | W. | N.W. | Vble. | Calm. |
| October. . | 4¼ | 7¾ | 9 | 1 | 1¼ | ¾ | 1¾ | ½ | ¼ | 4½ | 4½ | 10 | 3½ | 1¾ | 1½ | 1¼ | ¾ | 4 | ½ | 3½ | 2 | 7¼ | 5¾ | 0 | 0 | 2½ | 9¾ | ¾ | ½ | 2½ |
| November . | 1 | 4½ | 11¼ | 2 | 0 | ¼ | ¼ | ½ | 1¼ | 9 | ¾ | 3½ | 3¼ | 6½ | 1¾ | 2½ | 3 | 5¼ | ¼ | 3¼ | ¼ | ½ | 8¾ | 0 | ¼ | 0 | 16 | 0 | ¼ | 4½ |
| December . | 2¾ | 2½ | 4¾ | 2 | 2¾ | 2 | 1 | 4¼ | ¾ | 8¼ | 2½ | 6½ | ½ | 2¼ | ¾ | ¾ | 8½ | 6½ | 0 | 2¾ | ¼ | 1½ | 14 | 0 | ½ | 0 | 6½ | 0 | ½ | 7¾ |
| January . | 2¾ | 2¾ | 4¼ | 1 | ½ | ¾ | 2½ | 5 | 1 | 10½ | 1¾ | 3¾ | 1¾ | 1½ | ½ | 2½ | 9¼ | 3¼ | 0 | 6¾ | ¼ | 0 | 3¾ | ¾ | ¼ | ¾ | 16¼ | 1½ | 1 | 6½ |
| February . | 3 | 3¼ | 2¾ | ½ | 1¼ | ½ | 3½ | 4½ | ½ | 9½ | 3¾ | 2¾ | 1¾ | 2¾ | ½ | ¼ | 2 | 8¾ | 0 | 5½ | 0 | 2 | 1½ | 0 | 0 | ¼ | 16 | 0 | ¼ | 8 |
| March . . | ½ | 4 | 2½ | 1¼ | ½ | ¼ | 2¾ | 3 | ¼ | 16 | 1¾ | 4¼ | 3½ | 5½ | 1 | 1½ | 5¼ | 4 | 0 | 5¼ | 1 | 2¼ | 6 | 0 | 0 | 0 | 15½ | 0 | 1 | 5¼ |
| April . . | ¼ | 9 | 8¼ | 1¼ | ½ | 1¼ | ½ | ½ | 2¼ | 6 | 4½ | 5 | 5 | 1 | 1 | ¼ | ¾ | 8¼ | 1¼ | 1¼ | 0 | 2½ | 9¼ | ½ | ½ | ¾ | 10¾ | 1 | ¾ | 3¾ |
| May. . . | 1¾ | 6 | 6¼ | 1 | 1 | 0 | 3½ | 1½ | ¾ | 9¼ | 3¼ | 1¾ | 1¾ | 6¼ | 3¼ | ¼ | 4 | 6½ | ¾ | 2½ | ½ | 1 | 20 | 0 | 0 | 0 | 3 | 1¾ | 1¼ | 3½ |
| June . . | 1½ | 1¾ | 2¼ | 2½ | 1 | 2¾ | 5¾ | 5½ | ¾ | 6¼ | 6½ | ¾ | ¾ | 2½ | 1½ | 1¼ | 2¾ | 6½ | 3 | ½ | 3 | 5¼ | 14¾ | 0 | 0 | 0 | 1½ | 1 | 2½ | 2 |
| July . . | 3¼ | 3½ | 1 | 1¼ | ¼ | ¼ | 6½ | 5¼ | ¼ | 9½ | 3½ | 3¾ | 1½ | 2½ | 3½ | 3¾ | 9¼ | 1¾ | ¾ | ¾ | | | | | | | | | | |
| | 12 days only in August. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| August . . | 1¼ | 1¾ | 1¼ | ¼ | ¼ | ¼ | 2¾ | 1 | ¼ | 3 | 1 | 2 | 2 | 4 | 1½ | 4 | 8¾ | 3¾ | 2¾ | 1¼ | August 8, 1854, *Enterprise* passed Point Barrow south-westward. | | | | | | | | | |
| | 15 days only in September. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| September . | 4¾ | ¾ | ½ | 0 | ¼ | ¾ | 5 | 1¼ | 0 | 1¾ | 2¾ | 4¾ | 1¼ | 3¾ | 1 | 2 | 5¾ | 5¼ | 3¼ | ¾ | | | | | | | | | | |

# TABLE II.

## Thickness of Ice.

### H.M.S. *Enterprise*.

| Date. | Walker Bay. 1851–52. | Cambridge Bay. 1852–53. | Camden Bay. 1853–54. |
|---|---|---|---|
| October . . . . . | 0′ 0″ | 2′ 0″ | 1st. 0′ 7″ |
| November . . . . . | 0′ 6″ | 2′ 8″ | „ 2′ 2″ |
| December . . . . . | 2′ 10″ | 3′ 0″ | „ 2′ 11″ |
| January . . . . . | — | 5′ 2″ | „ 4′ 0″ |
| February . . . . . | 4′ 4″ | 4′ 2″ | „ 5 0 |
| March . . . . . | 5′ 5″ | 2′ 7″ | „ 6′ 0″ |
| April . . . . . | 5′ 7½″ | 4′ 2″ | „ 6′ 2″ |
| May . . . . . | 5′ 3″ | 5′ 6″ | „ 7′ 0½″ |
| June . . . . . | 5′ 1″ | 5′ 1″ | „ 7′ 2″ |
| July . . . . . | 4′ 10″ | 3′ 9″ | „ 4′ 7″ |
| August . . . . . | — | 4′ 3″ | — |
| September . . . . . | — | 3′ 7″ | — |

# EPILOGUE TO THE JOURNAL.

ON the 17th May, 1855, the *Enterprise* arrived at Sheerness, 5 years and 116 days since she left the Thames, of which rather more than 3 years had been spent in the ice without communication with the outside world.

Some idea of the track covered by the *Enterprise* can be realised by the record in the Journal on arriving at Hong Kong, February 1851:— "Since we left Plymouth on the 20th of January, 1850, we have gone over 35,225 miles of sea; have traversed the Atlantic Ocean from lat. 49 N. to 52 S., and the Pacific from 53 S. to 73 N., and circumnavigated two-thirds of the globe; having been 343 days at sea and 48 at anchor." The accompanying chart of the world illustrates this and the further track up to 1855.

The commander was received by his relatives and personal friends, not only as one who had been lost and was found again, but as the successful navigator of Arctic channels hitherto considered impracticable for ships, and who, though he had failed in the object of his voyage, had gone about it in the way to deserve the success he just missed obtaining. At the rectory down in the north there had been great anxiety during those 3 years of total silence, intensified, as it went on, by age and illness; and by November 1854 it had deepened into fear that there would be no meeting between the parents and the beloved son. On his own birthday, to the sick-room came the life-giving news, recorded by the father in his Journal, "Oh, joy! this evening brought a telegram from the Admiralty, announcing his arrival at Port Clarence;" which was followed by a note from the then First Lord to a sister of the *Enterprise's* captain:—

"DEAR MADAM,

"As a proof of my kind feelings and goodwill, let me have the pleasure of announcing to you the safety of your gallant brother. I sincerely congratulate you on this happy end to your natural and praiseworthy anxiety.

"I have, &c.,

"J. E. GRAHAM."

But his professional chiefs did not so receive him; in official eyes the merit of this long and able conduct of a difficult enterprise was wiped out by the troubles of discipline and personal disputes which he brought home for them to settle. The Admiralty were by this time tired of the search and its great cost, and had no desire to add to their difficulties by parading courts-martial before the public. In whatever manner such Courts awarded justice, the Admiralty would suffer; whereas, if they could be avoided, nobody would suffer but the complainants.

Great pressure was put upon him from high quarters to allow all matters that had occurred of this kind to be compromised; but it was only after some time that he consented. His own sense of what was due to the proper discipline of the Service, added to the extra labours and anxieties caused by these troubles, made him feel that such a course was wrong, both for the Service and for his own credit. And, finally, the qualified consent which he gave was interpreted so liberally by the Admiralty that he felt himself put in a wrong position.

Thus a coolness between the Admiralty and the *Enterprise* expedition occurred, and, unfortunately for the commander, the one official who knew him well and understood his character, Sir Francis Beaufort the Hydrographer, had retired from public service. There was no acknowledgment on the part of the Admiralty of the work done by the *Enterprise*, and that omission added greatly to the feeling of disappointment at having been so near to the object of search and yet missing it. A Committee of the House of Commons was then sitting to adjudicate the awards to be given for the discovery of the North-west Passage; and Captain Collinson

sent in a representation on the part of the *Enterprise*, claiming not the discovery, but other services towards opening a practicable north-west passage, as deserving of some recognition. These services were strongly supported before the Committee by Sir Roderick Murchison (then President of the Royal Geographical Society), who quoted a paper by Admiral Beaufort to the same effect, in which he said: "When future navigators dash through (this passage), to whom will they look back as their real pioneers? Banks' Straits and Investigator Straits will never be attempted by them, but a few hours' fair wind and fine weather would run down the track of the *Enterprise* from the westward, and lead direct up Peel Sound, through which the *Erebus* and *Terror* must have passed. Those, then, are the men whom future navigators will honour as the *bonâ fide* discoverers of the North-west Passage; let the name of the discoverer of the North-west Passage be for ever linked to that of Sir John Franklin." To which Sir R. Murchison added: "That is the opinion of persons who understand the subject much better than myself; and the Americans think that the route Captain Collinson has taken is likely to become the course which whalers and other ships will follow for mercantile purposes."

The Committee, however, came to the conclusion that the *Investigator* was the only vessel which fulfilled the conditions that had been laid down by Parliament many years before, for entitling explorers to receive the reward then determined on for discoveries towards a North-west Passage; and they awarded £5000 to Captain M'Clure, with £5000 to his officers and crew. The reason why they did not award the whole £15,000, as settled in 1818, was no doubt that the terms in which it was then prescribed implied an approach from the eastern side only. The Committee further made honourable mention of Captain Kellett and Captain Collinson, these two officers having been particularly brought to their notice for special services in connection with the subject of their inquiry. Lady Franklin had also made a representation to the Committee, to the effect that from the relics of her husband's expedition, which had then been found by Dr. Rae,

it appeared almost certain that Sir John Franklin had discovered a north-west passage by Boothia, before Captain M'Clure's discovery. But the Committee thought they could not take into consideration a probability that had not been cleared up. And, lastly, the Committee recommended that some honorary reward, in the form of a medal, should be given to all those officers and men who had participated in the search.

This Committee was somewhat limited by its instructions, which were to report on the reward due for the services of "The Expedition to the Arctic Seas commanded by Captain M'Clure"; but in truth there was no expedition commanded by Captain M'Clure, and whatever expeditions there were, were for the discovery of Sir J. Franklin's ships, and not for that of the North-west Passage.

Captain Collinson, in his evidence before the Committee, went far to determine their report by stating that the course Captain M'Clure followed was consistent with the instructions he himself had given that officer: but he allowed that he had never contemplated the possibility of M'Clure's arriving at Behring Straits before the *Enterprise*, and had therefore given no instructions to meet that contingency.

The result in Captain Collinson's mind was a deep feeling that the very long and peculiar services of the *Enterprise* had not been rewarded by any fitting recognition on the part of the Government; and this feeling was never altogether removed by any act of the authorities; so, after completing the official records of his Expedition, he retired to his home in the north, and never again applied to the Admiralty for any active service. The only Government employment he subsequently had was in some mixed committees on general service matters.

He was rewarded otherwise, by the opinion of his brother officers and scientific friends, as to the value of the work done during this voyage. The Royal Geographical Society gave him their gold medal in recognition of his elucidation of the passage along the North-American coast, as well as of his other scientific reports; and he was a member

of their council for many years. In his own country he was received with acclamation, the distinguished son of a greatly respected father; and other public professional societies were glad to obtain his practical experience and good judgment. But his interest in the Arctic seas never subsided: and it was immediately brought into action by the determination of the high-spirited Lady Franklin to clear up the doubt that still covered her husband's fate. He took an active part in the powerful representation to the Government, made by a large number of the principal scientific men of the day, that this duty should be undertaken by the nation. And, when the Government finally decided against any such scheme, Captain Collinson was one of the earnest and active supporters of Lady Franklin, in sending out a private vessel, the *Fox*, under Captain M'Clintock, to make the attempt.

## The Voyage of the *Fox*, 1857–9.

This was a very hazardous undertaking; the vessel was small for the purpose, only 177 tons, and went alone, with a crew of twenty-four, all told; it had, however, the advantage, possessed by none of the former great national expeditions, of a definite clue as to the direction in which to look, and it had the security of being commanded by Captain M'Clintock, the most experienced Arctic voyager of his day, with the assistance of the able and enterprising seaman, Captain (now Sir) Allen Young: and finally, it had steam power.

Her small size, however, very nearly brought her into the same condition of helplessness as has befallen so many of these little Arctic ships. During eight months of the first winter she was a prisoner in the ice in Baffin Bay, and was only released in the spring of 1858 to begin again at the mouth of the bay. This was her probation; on the second trial, after being stopped in Peel Sound, she got through Prince Regent's Inlet down to the east end of Bellot's Straits, and half-way through them, before being stopped by the impenetrable ice in what is now Franklin Strait.

In the spring of 1859 came the final success of all those

years of extensive searching: and the long-sought relics were found in the corner of the Arctic seas to which slight unheeded indications had been pointing, but which till that time had never been fully examined. On the west coast of King William Island was found a boat, and the remains of some bodies, and many articles belonging to the two ships, and, what was most precious of all, a short notice written hastily on the printed form generally used for such purposes, giving the only definite information about their proceedings found during the whole search. It was to the effect that the two vessels had gone up Wellington Channel from Beechey Island, in the summer of 1845, as far as latitude 77°. That they had wintered at Beechey Island in 1845–6, as was already known. That in September 1846 they were beset in the ice in lat. 70° 5′, long. W. 98° 23′ (though by what channel they got there was not stated). This position is about 15 miles N.W. of the N. point of King William Island. A subsequent notice on the same paper stated that the two ships (*Erebus* and *Terror*) had been deserted 5 leagues N.W. of Victory Point, in April 1848; that Sir John Franklin died in June 1847; and that all the people left out of both ships, 105 in all, had landed on King William Land, and intended to make for the Back or Fish River.

The character of the articles found, and their scattered state, gave the discoverers the impression that the ships had been hastily deserted, doubtless from a sudden breaking up of the ice in the spring of 1848; although they had remained during the whole of the summer of 1847 fixed in the ice near the same spot. The native account was that one ship had been crushed by the ice, and no goods saved out of her; and that the other had been driven ashore: nothing, however, was found by the discoverers confirming this last report. As to the ultimate fate of the 105 officers and crew, who started to make for Back River, the other remains found by M'Clintock's parties, near the mouth of that river and on the way to it, confirmed too surely the statement of the natives that they all perished of hunger and exhaustion. The provisions of the ships must have been exhausted, and there was little food to be found.

Had they left notices of their movements in Barrow Strait, the *Enterprise* (which got so nearly to the spot in 1853) might, when under Sir James Ross in 1848, have saved some of them, and so prevented the heaviest sacrifice that the North-west Passage has cost Great Britain.

Thus it appears that in the summer of 1846 Sir J. Franklin's ships had reached a position in Victoria Strait from which he knew, by his previous travels along the coast of North America, that there was an unbroken water-way to Behring Strait; which water-way was proved by the *Enterprise*, in 1853, to be navigable for ships from Behring Strait to Camden Bay, or to within 180 nautical miles of the last position of the *Erebus* and *Terror:* and in 1853 Captain Collinson could have confirmed Sir J. Franklin's knowledge, by having passed up from Camden Bay to the north of Victoria Straits on the ice, in his sledges—as, indeed, could also Dr. Rae, who went up the Strait in boats in 1851, and thereby most nearly of any Arctic traveller accomplished a North-west Passage by water. Hence it may be fairly said that in 1846 a discovery of a North-west Passage was made by Sir J. Franklin precisely similar to that discovered by Captain M'Clure at Banks' Island in 1850, the *Enterprise* having had the extraordinary fortune to assist as it were in both discoveries, without being able to claim the merit for either.

Thus then ended the epos of the great search for Sir J. Franklin; the final scene being the assembly of the principal Arctic notables in Westminster Abbey to witness the completion of a monument to the memory of that enterprising and unfortunate voyager erected by his devoted widow.

INSCRIPTION ON THE MONUMENT.

"Not here: the white North hath thy bones; and thou,
Heroic sailor soul!
Art passing on thine happier voyage now,
Towards no earthly goal."—*Tennyson.*

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Whether the North-west Passage will ever prove to be worth the lives and the money expended on it by the British

Government is a question which probably few persons now would answer in the affirmative. But we must not conclude too hastily, from that one consideration, that those expeditions have been of no value to our country. Begun in a time of profound peace, they assisted greatly during those forty pacific years in keeping up a spirit of enterprise in the Navy, and providing an object on which the energies of our seamen could be well employed. As that sagacious Arctic voyager, Admiral Sir G. Richards, himself no devotee to the North-west Passage, well observes in his excellent preface to 'Captain Nares' Voyage in 1875,' it is through such means that "a band of officers and seamen were trained in a school, the stern necessities of which have been instrumental in forming and fostering those qualities of fortitude and habits of self-reliance and self-denial, which are certain to tell with effect at some period of a seaman's career, and which no maritime nation can afford to hold lightly." Money and even lives are well expended upon such enterprises, by a country which has to depend so greatly for its actual existence on the character of its seafaring population, although they bring little material return for the expenditure.

But another object, of more general interest, has been put forward in support of a continuation of Arctic exploration: and that is the advancement of our knowledge of natural phenomena and of the laws of nature. The general excitement caused by that long search produced a corresponding action in other countries, and was followed by a succession of expeditions from various states for the further exploration of the Arctic seas, and especially of penetrating nearer towards the Pole. That ultimate goal of Arctic ambition bade fair to replace the North-west Passage as the next prize for the contention of restless travellers; but a wise and experienced explorer, Lieutenant Weyprecht of the Austrian service, judiciously called attention to the more practicable and useful benefits to be obtained from the Arctic regions. In the introduction to Lieutenant Payer's 'Account of the Voyage of the *Tejethoff* in 1872–4,' there is given the address of Lieutenant Weyprecht (who commanded that expedition) to

a meeting at Gratz in 1875, in which he points out that "the Polar regions offer greater advantages—in certain important respects—than any other part of the globe, for the observation of natural phenomena, such as Magnetism, the Aurora, Meteorology, Geology, Zoology, Botany." And he strongly impresses this leading idea, that "the main purpose of Arctic expeditions is not geographical knowledge, but the extension of knowledge of phenomena;" and he lays down the three following aims for such expeditions in their order of importance:—

*First.* The knowledge of the laws of nature.

*Second.* Geographical discovery, extending the fields of scientific investigation.

*Third.* Minute Arctic topography.

Lieutenant Weyprecht's exertions have already produced fruit, in the series of simultaneous observations taken by several countries in Arctic and Antarctic regions in 1881–2; and his ideas have this great merit over the former plan of operations, that they can and indeed must be carried on regularly and continuously, and with comparative ease and safety, advancing step by step from the known to the unknown, and assimilating as they go all the information to be got out of the region they are in. And, as regards economy and certainty of result, such a system of Arctic or Antarctic exploration is decidedly superior to that hitherto employed by almost all countries—namely, of dispatching isolated expeditions to penetrate as far as possible at once, and without relation to or connection with other expeditions, and without assured arrangements for relief.

# APPENDIX.

## NOTES TO THE JOURNAL.

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## NOTES TO THE JOURNAL.

BY THE EDITOR.

### Note 8, p. 68: Separation of the Ships.

In the two accounts of the voyage of the *Investigator* on this expedition—one by Captain Sherard Osborn, and one by Dr. Armstrong, surgeon of the ship, and both published in 1857—there are expressions implying that during the voyage from England to Behring Strait the *Enterprise* had rather deserted her consort, and had thereby acted in a contrary spirit to the imperative orders of the Admiralty; and had thus justified Commander M'Clure in taking advantage of the opportunity of his arriving first at the ice to go in at once without waiting for his senior officer. These published expressions were never answered by Captain Collinson, and in themselves they require no answer, for the whole tone of both these books displays a bias towards magnifying the operations of the *Investigator* and her commander, and for putting the discovery of the North-west Passage prominently before the public; and therefore any private opinion expressed in them would be valued accordingly.

But, as Captain M'Clure's despatches to the Admiralty at the time imply that he considered his commander's instructions to him constituted the *Investigator* an independent part of the expedition, if he should not meet the *Enterprise* at Behring Strait—and as the public record of his voyage in the Journals of the Royal Geographical Society makes the same implication, it is necessary, to do justice to the conduct of the commander of the expedition, in this the first published record of his part in it, to state the circumstances of the separation from the commander's own Journal and from the public despatches. This is more bounden on the Editor, as there is some reason to believe that the separation of the two ships injured Captain Collinson in the eyes of the Admiralty, and that it destroyed the favourable chance there was of discovering the object of their search.

Immediately on leaving Plymouth it was found that the *Investigator*

was a slower sailer than the *Enterprise*. Captain Collinson thus records his decision on this:—"*Investigator* carried away her fore-topmast in carrying sail to keep us company. Thinking that in light winds she would have the advantage, I determined not to delay our progress by keeping company; and, as it turned out, the vessels were never more than two days apart until March 31st, when we obtained the advantage by standing to the southward, while Commander M'Clure, being desirous to hug the coast of South America, stood to the N.W.; and this brought us to the Strait (of Magellan) eight days before him."

At the entrance of this Strait the *Enterprise* met H.M. steamship *Gorgon*, ordered there by the Admiralty to assist the two ships in getting through them. Captain Collinson left her there for the *Investigator*, and went on under sail (because the really difficult part is near the W. end of the Straits); and on arriving at this difficult part, he took the opportunity of the delay to obtain fresh provisions for both ships.

*Extract of Letter to Sir F. Beaufort.*—"Believing that the lame dog was the one requiring help, I left the *Gorgon* to bring on our consort, directing Captain Paynter to rejoin me in the Straits if she had not arrived by the 17th, as unless I clear the western entrance by the 22nd I shall be late; and if we reach the ice without the *Investigator*, I must take the *Plover* in and leave her as the reserve."

When the *Investigator*, in tow of the *Gorgon*, arrived, there was a further delay of three days to provision her, and on account of weather. The *Gorgon* then towed both ships at once through the narrow part; but when they got into the Pacific there was such a violent gale and heavy sea, that after breaking several tow-ropes, and trying to take each vessel separately for two days, Captain Collinson authorised the *Gorgon* to leave, and the two ships of the expedition started again on their own courses, with the understanding that they were to meet at the Sandwich Islands.

The *Enterprise* arrived at the Sandwich Islands six days before the *Investigator*, and waited five days for her; then, "as the season was far advanced, I determined on proceeding alone, trusting that our detention in communicating with the *Herald*, or at the edge of the ice, would give her time to rejoin us." He left for Commander M'Clure a copy of Captain Kellett's letter, recommending them, if they were late, to try the direct course through the Amoukta Channel of the Aleutian Islands; and also following instructions:—

"H.M.S. *Enterprise*, Oahu,
*June 29th*, 1850.

"*Memo.*—So soon as Her Majesty's ship under your command is fully complete with provisions, fuel, and water, you will make the best of your way to Cape Lisburne, keeping a good look-out for *Herald* or casks, and firing guns in foggy weather after passing St. Lawrence. The whalers also may afford you information of our progress.

"Should you obtain no intelligence, you will understand that I intend to make the pack close to the American shore, and pursue the first

favourable opening W. of the coast stream, pressing forwards towards Melville Island. In the event of meeting land, it is most probable that I would pursue the southern shore; but conspicuous marks will be erected if practicable, and information buried at a 10-foot radius.

"As it is necessary to be prepared for the contingency of your not being able to follow, by the ice closing in or the severity of the weather, you will in that case keep the *Investigator* as close to the edge of the pack as is consistent with her safety, and remain there until the season compels you to depart, when you will look into Kotzebue Sound for the *Plover*, or information regarding her position; and having deposited under her charge a twelvemonth's provision, you will proceed to Valparaiso, replenish, and return to the Straits, bearing in mind that the months of June and July are the most favourable. A letter from the Hydrographer relative to the variation of the compass is annexed, and you will bear in mind that the value of these observations will be greatly enhanced by obtaining the variation with the ship's head at every second or fourth point round the compass occasionally, and she should be swung for deviation in harbour as often as opportunity may offer.

"Should you not find the *Plover*, or that any casualty has happened to render her inefficient as a depot, you will take her place; and, if (as Captain Kellett supposes) Kotzebue Sound has proved too exposed for a winter harbour, you will proceed to Grantley Harbour, leaving a notice to that effect on Chamisso Island. The attention of your officers is to be called to, and you will read to your ship's company the remarks of Sir J. Richardson concerning, the communication with the Esquimaux contained in the Arctic Report received at Plymouth.

"Your operations in the season of 1851 cannot be guided by me, nor is there any occasion to urge you to proceed to the N.E.; yet it will be highly desirable, previous to entering the pack, that you completed provisions from the whalers, and obtained as much reindeer's meat as possible. Captain Kellett's narrative will point out where the latter is to be had in most abundance, and where coal can be picked up on the beach; but husband the latter article during the winter, by using all the drift-wood in your power.

"In the event of leaving the Straits this season, you will take any weak or sickly men out of the *Plover* and replace them from your crew, affording Commander Moore all the assistance in your power, and leaving with her Mr. Miertching, the interpreter, instructions with regard to whose accommodation you have received and will convey to the captain of the *Plover*.

(Signed) "RD. COLLINSON,
"Captain.

"To Commander M'Clure,
"H.M.S. *Investigator*.

"Should it be the opinion of Commander Moore that the services of the *Investigator's* ship's company in exploring parties during the spring would be attended with material benefit to the object of the expedition, he will,

notwithstanding these orders, detain you for the purpose; but care must be taken that your efficiency as a sailing vessel is not crippled by the parties not returning in time for the opening of the ice.

"R. C."

What strikes a landsman reading these orders (long after the expedition is all over) is the omission of any distinct directions in case the *Investigator* arrived at the ice before the *Enterprise*: probably the senior officer thought it unnecessary to point out to his junior consort that she should wait for his arrival. In these sort of expeditions it is frequently desirable that the vessels should separate, but in general clear directions are given by the senior officer to ensure their meeting again. In this instance the only sort of allusion to the contingency above mentioned is in the words, "should you get no intelligence there," "my intentions are" to do so-and-so: that evidently means, "no intelligence of my movements from *Herald* or *Plover*." It is to be regretted that it was not more distinct, considering the very strong orders of the Admiralty not to suffer the two vessels to separate, except in the event of accident or unavoidable necessity. As Dr. Armstrong properly remarks, "Two ships are always sent on Arctic expeditions for mutual succour and support, and for salutary controlling influences, no less than for the social effect." But this separation, of course, applies to all action *after* entering the ice; the ice gate is the place of rendezvous for the real commencement of the expedition.

Commander M'Clure interpreted these orders to mean that, if he found no intelligence of the *Enterprise* on arriving at the ice, he was to consider himself independent. In the record of his voyage given in the Journal of the Royal Geographical Society, his journal is quoted, that he received instructions at Honolulu "that, in the event of not meeting the *Enterprise* at Cape Lisburne, he was to act entirely on his own judgment," "which was the most satisfactory direction he could have left me." The *Investigator* arrived at the Sandwich Islands a day after the *Enterprise* had left, and left the next day. Commander M'Clure took the bold step of following the advice of Captain Kellett, and making a straight course through the Aleutian Islands; and was favoured with fair winds, though the actual passage through the islands was a risky one, being in a dense fog, through which they could hardly distinguish the land. Of going through these islands, the American Captain de Long, who traversed them in 1880, a little further east, says: "I have seen some crooked navigation, but our experience in getting through the passes into Behring Sea goes far beyond anything for difficulties." On his way M'Clure wrote to the Admiralty:—

"*July* 20*th*, 1850.

"I have received instructions from Captain Collinson, clear and unembarrassing, to proceed to Cape Lisburne in the hope of meeting him in that vicinity. I can scarce venture to hope that, even under very favourable circumstances, I shall be so fortunate. It is, therefore, under the probable case that this vessel may form a detached part of the expe-

dition, that I feel it my duty to state the course which, under such a contingency, I shall endeavour to pursue."

Then he goes on to lay down schemes for his ship for the next two years, tending in the direction of the N.W. of Melville Island—not a word about following the line indicated by his senior consort. Then, on arriving at Kotzebue Sound (a little S. of the rendezvous, Cape Lisburne), he writes again to the Admiralty:—

"*July* 28*th*, 1850.

"I have not seen anything of the *Enterprise*, nor is it my intention to lose a moment by waiting off Cape Lisburne, but shall use my best endeavour to carry out the intentions contained in my letter of the 20th."

At Cape Lisburne he met the *Herald*, and endeavoured to persuade Captain Kellett that the *Enterprise* must have gone on into the ice; but that officer, knowing Captain Collinson well, was certain he would not have gone into the ice without leaving some instructions for his consort; moreover, as the *Investigator* had left the Sandwich Islands only two days after the *Enterprise*, and had made a quick passage by a shorter route, it was most probable that she was now in advance of that vessel. In fact, the *Enterprise* was 44 days in going from the Sandwich Islands to the rendezvous at Cape Lisburne, and the *Investigator* was only 28 days; thus, by boldness and good fortune, the *Investigator* had gained the advantage over the *Enterprise* of about the same number of days that the latter had been detained waiting for her consort in the previous part of the voyage. It is remarkable that the *Enterprise* should have missed both the *Plover* and the *Herald* on her first passing up Behring Strait, and also have missed finding the notices left by Captain Kellett. This ill-fortune was due to fogs and bad weather. So Captain Kellett hesitated to let the *Investigator* go; and then M'Clure cut the knot by sailing away: in fact, the two ships were only a few hours together, and never at anchor.

This was certainly a very strong step for the junior vessel of an expedition to take; and however much the boldness and ability of Captain M'Clure may be admired, and whatever his belief in the tenor of his instructions, and however good his intentions, an impartial reader of all the records of these circumstances can hardly fail to come to the conclusion that it was a great stretch of the power he accidentally possessed at the moment. Taking the most liberal interpretation of these instructions, he surely ought not to have gone on until he had exhausted all the chances of hearing of his superior officer. Whereas M'Clure, by his letter of the 28th of July, written before he arrived at the appointed rendezvous, showed rather a desire to avoid the chance of meeting; and he declined to wait even the 48 hours Captain Kellett wished him to do.

In considering the action of the two vessels, I think it is reasonable to take into account the different responsibilities of the two commanders. Captain Collinson was responsible for the conduct of the whole expedition; and if by waiting too long for his consort he lost the season, when by going on alone or taking the *Plover* into the ice with him (as he was

expressly authorised to do) he might have saved the season, he would have been properly subject to blame; because it was not a case of mere exploring, in which the loss of a year was of little consequence; it was a matter of life and death, and every day gained might have been a life saved. This was evidently his own idea of his duty; and, if a second commander had been put on board the *Enterprise* (as was originally intended), his position and his action would have been more clear.

It is also right to point out that, in losing his consort, he lost his Esquimo interpreter, Mr. Miertching, whom he let remain on board the *Investigator*, because he was comfortably berthed there. And his intention and his desire of rejoining his consort was indicated by his returning to the ice again to look out for her, in September, 1850, after he heard of her fortunate passage.

All that Captain Collinson said of the matter on hearing of it was, "Our consort has our hearty good wishes and fervent prayers that she has reached a position I should have coveted." And subsequently, when he came finally out in 1854, he defended Captain M'Clure when he was attacked in the papers, and said of him, "To him belongs the honour of first navigating the Arctic Sea along the American coast, and the discovery of the Prince of Wales Strait. Heaven knows I would not rob him of one atom of his well-won honours: neither of us have succeeded in the grand object which animated our endeavours; but he, being first in the field, has added greatly to our geographical knowledge."

Captain M'Clure, by his decision on this occasion, gained for his ship the honour of the discovery of the last link in the long-sought North-west Passage; but there is fair reason for the supposition that, if he had waited for his consort, not only would the North-west Passage have been discovered, but the remains of the Franklin Expedition would also have been found. For, if he had waited, it is reasonable to suppose that the two vessels would have proceeded together up the Prince of Wales Strait (as they did separately), and that in 1852 they would have gone together along the coast of America to the eastward (as the *Enterprise* did); and in the spring of 1853, having double the number of sledges, the E. side of Victoria Strait would have been examined as well as the W. side (which was all the *Enterprise* could do), and therefore the remains of the Franklin Expedition (afterwards found in 1859 by Captain M'Clintock in Lady Franklin's private expedition) on the coast of King William's Land would have been discovered in 1853.

## Note 15, p. 148 : LOW LAND, NORTH AMERICAN COAST.

The whole of this coast, from Point Barrow to Cape Bathurst, is quite low. Captain Maguire (*Plover*) describes the country as one vast plain, without rock or stone, and scarcely an elevation, and composed of dark blue clay (*Osborn*, p. 53). The vegetation consists almost entirely of moss and grasses, with a burst of flowering plants in the early summer; it is sufficient, however, to support a considerable number of reindeer.

This land slopes gradually into the sea, forming a shallow coast with numerous shoals and banks, extending nearly 50 miles from the coast, at which distance the water deepens greatly; the north coast of Siberia has much the same character. The only break in the uniform level is the Romanzoff chain of hills, west of the Mackenzie River, which appears to be the most northern branch of the great range of the Rocky Mountains, a range which extends along the whole of the west side of North America, lying nearly parallel with the west coast—that is, in a direction towards N.N.W. (generally). Sir J. Richardson (*Arctic Expedition*, 1851) says: "The successive ridges of this range, towards the northern coast, come out *en échelon*, diminishing in altitude as they approach the shore of the sea;" and that the Alaska chain (which forms the promontory of that name, and also the Aleutian Islands) is volcanic, and contains peaks of the height of 16,000 feet. The projecting land extending from this chain towards Behring Strait and Point Barrow is generally of the low alluvial character.

The Rocky Mountains are mainly of granite, gneiss, and similar primary rocks. The valley of the Mackenzie River is of secondary rocks—sandstone and limestone—belonging to the Silurian or Laurentian strata; and they appear near the north coast, along the space from the mouth of the Mackenzie to the mouth of the Coppermine River. East of the Coppermine River valley is another belt of primary rocks—granite, gneiss, &c.—but of no great elevation; these are the cause of the rocky islets in the Dolphin Strait and the Simpson Strait, which make the navigation of that channel so difficult.

## Note 16, p. 148 : The Mackenzie River.

The effect of the large body of fresh water in this considerable river, coming from the warmer south on the breaking up of the ice, brings down quantities of drift timber and mud, and raises the temperature of the sea, clearing it of ice for a considerable distance. The *Investigator* found brackish and muddy water at 50 miles from the coast, and open water at 100 miles from land opposite the Mackenzie, and at 14 miles from land opposite the Colville River, with a rise of temperature at the former from 28° to 39°. The *Enterprise* found the sea temperature at Mackenzie River 49°. The mouth of the Mackenzie is favourable for producing this effect, being an estuary gradually opening, and with many low islets. The benefit of warmer water to navigators is marred by the fogs, which frequently come from the air being colder than the water. The dense fogs continually arising from this and other sources during the navigable season have been one of the greatest causes of delay and trouble to Arctic voyagers in all parts of the Arctic seas.

### *Drift Timber in Mackenzie River.*

The Mackenzie is said by Sir J. Richardson to be the principal, if not the only, river on that coast which brings down any considerable quantity of drift timber. It is by far the largest of those rivers, and comes from farthest south. The latitude of its source, which is well in the bosom of the Rocky Mountains, marks the line of watershed between the streams that flow into the Atlantic and those that flow into the Arctic Sea. And, as it flows also through a comparatively fertile soil, its banks are well covered down to near its very mouth. Hence, from source to mouth, it is well charged with timber. This drift timber is spread along the shores of the channels on the North American coast, both to the east and to the west, but chiefly to the east; and is carried up the west side of Banks Island and up Prince of Wales Strait, thereby marking the prevalent current. It is sometimes of great size: the *Investigator* found a trunk in the sea big enough for her mainmast, and the *Enterprise* got one 68 feet long. And it is found in great quantities. In the autumn of 1853, the *Enterprise* (which had come from the eastern parts on purpose to get at the drift supply of the west) found about Camden Bay, which lies between the Mackenzie and the Colville Rivers, enough for the ship's consumption during the winter. One trunk was 94 feet long and 14 inches diameter at the small end. The action of the mass of driftwood coming down every summer upon the coast is a good existing illustration of the way in which the alluvial parts of the land have been formed. As the shoals made by the sand and mud from the

rivers rise towards the surface, the drift timber lodges upon them and consolidates them, and raises them above the surface; the ice floes then grounding on these shoals, and being driven up their slopes by pressure of the floes behind, force up the mass to a higher level; and when this occurs in an estuary, a part of it becomes enclosed from the sea, and is gradually filled by detritus from the river.

On the N.W. coast of Banks Island, and also on Prince Patrick Island, large beds of trunks have been found inland, and several hundred feet above the level of the sea. These are lying horizontally, in confused masses, just as the driftwood now lies on the coast. The trees are of the same kind as are now growing within the Arctic circle, *Pinus strobus*, some of them 30 feet long and more than a foot in diameter; and in very different states of preservation, some being fit for use as timber, some being completely fossilised, or converted into bituminous lignite. All these have apparently been distributed by water, like the present drift-wood, and probably from the same general direction; but as some of the beds are 40 feet thick, and some have solid strata of great thickness above them, it is evident that this process must have been going on during considerable geological periods, and under varying conditions. At one period the present hills must have been below the level of the sea, and the climate must have been more suited to the production of vegetation than it is now; after that period the ground must have been elevated. This distribution of drift timber is quite distinct from, and not so remarkable as, the distribution of stones and mud by the great glacial action, which at some period of the above process was spread over all this region.—*From Sir R. Murchison, in the Arctic Papers, Royal Geographical Society.*

## Note 21, p. 177: The Aurora Borealis.

There is no authoritative declaration as to the origin of this beautiful phenomenon, notwithstanding the great number of precise observations of it that have been made by scientific men during the last sixty years in various parts of the globe. There is no decided evidence showing that it is caused by terrestrial magnetism or by any electric action. It is not apparently a reflected light, like rainbows and halos of the sun and moon; both a magnetic and an electric influence have been observed in connection with it, and again it sometimes appears to have quite a local position and form. The uncertain knowledge about this extensive and splendid aerial action, and the belief that an investigation of it will lead to important discoveries in electricity and magnetism, is one of the strong arguments used by scientific persons in favour of further Arctic and Antarctic expeditions, and, in fact, is considered by various high continental authorities to be the chief object of such expeditions.

The state of knowledge on the subject, and which has not been much increased since that time, is epitomised in the *Arctic Manual*, published by the Royal Society in 1875.

The name, Aurora Borealis, implies that it has some connection with the cold atmosphere of the northern regions, which is confirmed by its being generally seen during the winter months in those regions. For the same reason there is an Aurora Australis, visible during the same season about the South Polar regions. It seems hardly justifiable, however, to have borrowed the classic title of "the dawn," for by all accounts its appearance, grand as it is, is but a faint representation of the richness and brilliancy and beauty of the real dawn of day. But its appearance is not altogether confined to the Arctic Circle, nor to the winter season, nor is it more effective as you approach the Pole. M. Petermann, the celebrated geographer, says the zone of greatest frequency and intensity of its appearance passes near Point Barrow (Behring Strait), Hudson Bay, Cape Farewell (south of Greenland), the North Cape (of Europe), and along the north coast of Asia. This delimitation seems to imply that the presence of land carries it further south; but our present knowledge is too incomplete to draw any general conclusions.

It has, however, been observed often outside the Arctic Circle, and once as far south as Italy, and in April and June; and the Australis Aurora was observed at Madras in October, 1870, when also, it will be recollected, there was a beautiful display of the northern one all over England, and a severe winter.

*Its Appearance.*—The most decided opinion yet given, and which seems to express the general belief, is that of Lieutenant Weyprecht (*Austro-Hungarian Expedition*, 1872–4):—"I myself have come to the conviction,

without being able to give any positive weighty reasons, but from the observation of hundreds of Auroræ, that the Aurora is an atmospheric phenomenon, combined with the meteorological conditions." This does not, however, exclude the idea of an electric action; as M. Lemström (*Swedish Expedition*, 1868) says, "The cause of the clouds of the higher regions being discharged in the form of Aurora, and not in thunder and lightning, is the permanent moisture of the air."

The records of the finest appearances of the Aurora seem to confirm this idea. That distinguished scientist, (then) Captain Sabine (*Parry's First Voyage*), describes one at Melville Island, January, 1820:—"The various masses seemed to arrange themselves in two arches, one passing near the zenith, and a second midway between the zenith and the horizon, both north and south, but curving towards each other; . . . at one time a part of the arch near the zenith was bent into convulsions, like a snake in motion, and undulating rapidly."

Again, on Parry's third voyage (1824–5), they observed one "as a single compact mass of brilliant yellow light. We all simultaneously uttered an exclamation of surprise at seeing a bright ray of the Aurora shoot suddenly downward from the general mass of light, and *between us and the land*, which was there distant only 3000 yards."

Lieutenant Payer (*Austro-Hungarian Expedition*, 1872–4) describes them (about Franz Joseph Land) as "flaming arches with glowing balls of light, or irregular meridians on the heavens, or brilliant patches and bands of light; in frequent movement, like vapours driven by the wind, shooting in long flames." And always in the south, and appearing between September and March. He gives a good drawing of the snaky flames.

M'Clintock (*Voyage of Fox*, 1857–58) says:—"I often observe it just silvering, or rendering luminous the upper edge of a low fog or cloudbank, and with a few vertical rays feebly vibrating."

Mr. Grove (*Correl. Physic. Forces*) observed an Aurora at Chester, "when the flashes appeared close to the observer, so that gleams of light continuous with the streamers could be seen *between the houses of the town and myself*, like portions of a rainbow intervening between terrestrial objects and the observer. I seemed to be in the Aurora."

M. Lemström (*Swedish Expedition*, 1868) observed on the N.W. coast of Spitzbergen the auroral light on the outline of clouds above the mountain, and next day "a faint glimmer gliding along the *arête* of the mountain; . . . at other times the highest ridges were enveloped with a pale glimmer." Again, when entering the Norwegian Archipelago, "a continuous ring round the horizon, rays from which gradually met about the zenith."

### *Its Electric and Magnetic Connection.*

M. de la Rive (*Archives Sc. Physiq.*, tome 41) says:—"M. Lemström established, by a great number of facts, that the Aurora is due to atmospheric electricity; . . . this light is the consequence of electric discharges,

which in these regions, constantly charged with moisture, operate slowly and continuously. . . . He shows that terrestrial magnetism plays in this phenomenon only a very secondary part, giving to the streamers a certain direction."

Observations by M. Wijkander (*Swedish Expedition*, 1872–3):—"The observations agree in showing that the air conducts electricity very easily at relatively high temperatures, and to this is due the absence of thunder and the existence of the Aurora. This is said to be due to the moisture in the air in those regions, but the same temperature and the same degree of moisture do not produce this effect in lower latitudes. At the lower temperatures, −20° and −30°, and still lower, the air insulates better."

Belcher (1852–4):—December, 1852: "Aurora reported very brilliant; magnetometer exhibited the most unmistakable signs of disturbance," but electrometer not affected. Also: "Aurora apparently 200 feet from the masthead. Magnetometer affected." November, 1852: "Fine Parasalena. Magnetometer affected."

Maguire (*Plover*, 1852–4, *Point Barrow*):—"The Aurora was found to be connected with the movements of the declination needle: the brighter the Aurora, the quicker the magnetic changes."

Parry (*Second Voyage*, 1821–2) found that the Aurora did not affect the electrometer at the masthead, though Franklin had found that it did so on the coast of North America.

M. Becquirel (*Arch. Sc., No.* 41, 1871):—"In accounts of travellers in Norway we often read of their being enveloped in the Aurora, and perceiving a strong smell of sulphur, which must be attributed to the presence of ozone. M. Paul Rollier descended in a balloon on a mountain in Norway about 4000 feet high; saw brilliant rays of Aurora. To his astonishment an incomprehensible muttering caught his ear; when this ceased he perceived a very strong smell of sulphur, almost suffocating him."

Captain Back (*N. Am.*, 1820) observed an Aurora moving within 2 feet of the ground and parallel to it, attended with a rustling noise continuing for five minutes. No other Arctic observer has been satisfied that any sound proceeded from the Aurora.

Lieutenant Greely's party (*United States Expedition*, 1881), north of Smith's Sound, observed some splendid auroral displays in October, 1881, January, 1882, and November, 1882, all of which strongly affected the magnetometer. That in November, 1882, appears to have been one of the finest ever observed; it lasted for several days, in the form of arches of every shade and colour—pink, crimson, orange, primrose, yellow, green, lilac, purple—and not more than 100 feet above the ground; seemed within touch. Magnetometer violently disturbed.

*Professor Nordenskiold's Theory of the Aurora.*—(*Voyage of the* Vega *from the North Cape* (*of Europe*) *to Behring Straits*, 1878–9.)

This idea should have a place in any account of this phenomenon, not only from the great experience of the Professor, but from its interesting

character. It is based on a large number of personal observations, and calculations from the observations of others. He considers that the Aurora Borealis is a luminous coronal circle, floating constantly (in winter?) over the globe. The centre of this circle of light is a little north of the Magnetic Pole, and the diameter of its *inner* edge is about 2000 kilometres, or 0·3 of the radius of the earth. The plane of its action is perpendicular to the radius of the earth, touching the circumference at the centre of the auroral circle—that is to say, tangential to the earth's surface at that point, but at a height above the surface of the earth of 200 kilometres at the inner edge of the coronal circle.

The area in which this coronal circle is visible is bounded by two circles, having the auroral centre as their centre, and respective radii of 8° and 28° of arc measured on the surface of the globe. (This latter description must be approximate, as it appears to exclude some of the places from which the auroral circle has been observed).

*The above notes are taken chiefly from the Arctic Manual: in which is also to be found information of the spectral analysis of the auroral light.*

## Note 22, p. 182: SLEDGE TRAVELLING.

It appears to be the opinion of Arctic officers that sledge travelling, taking it generally, and as it came to them in those days of the Search, was about the most severe work to which man has ever been put, at least in modern times. This is very different from the popular idea of it; it is associated in our minds, even in Arctic countries, with reindeer or troops of dogs, running smoothly and swiftly over level ice or frozen snow. But when you leave the land and take to the frozen sea channels, reindeer become unmanageable, and dogs become troublesome, and only available for special occasions; for the main work of the sledge travelling you have to trust to man-power only. Then again, the native Eskimo or Laplander can, to some extent, choose his time and his route; his demands occur with regularity, and can be provided for at favourable moments, and generally by known and frequented ways. But the Arctic explorer has to get to a certain place, or try to get there, in a certain time, or it is no use his attempting it; and it is of the nature of his work that it is over unknown lands and seas, and therefore that he must be fully equipped for all emergencies, not only in food and cover, but even in fuel.

Thus it comes, that sledge travelling by Arctic explorers means dragging a weight of 200 lbs. per man over a very broken way, in heavy garments, with imperfect food and rest, and in a temperature which frequently produces frost-bites on the exposure of skin for a short time. And yet it is the only way in which a considerable part of the work of exploring can be done. A ship is indispensable, as a house and depot for the party, and for the proper conduct of the scientific observations; but a ship is imprisoned in the ice for ten months out of every year; and, after she is fast, there is a short time in the autumn and again a considerable period in the early summer when exploration can be carried on over the ice, often under great difficulties, though none so great as to stop the British sailor from going cheerfully and manfully to work.

### *Sledges.*

The sledges used by the Royal Navy were made of wood, of different sizes; Sir E. Belcher recommends sledges to be made of lance wood and shod with steel, and Captain M'Clintock recommends the hide seizings of the framework to be coated with coal tar to prevent animals eating them. The construction of a sledge and its packing, and the selection of food, and of fuel, and other equipment, have been naturally the subjects of great discussion among Arctic travellers, and of continual improvement: Sir Leopold M'Clintock, the happy terminator of the Great

Search, has the credit of having done more than others to perfect these arrangements; but still, on the last expedition in 1875, Sir G. Nares found something to add. The weighing out and arrangement of the food and other articles is generally done by the officer in command of the sledge himself, as a mistake in them might bring the excursion to an end. The best size of sledge for long journeys seems generally considered to be one for eight men; beyond this size the sledge becomes unwieldy on rough ice; but a sledge to carry a whale boat must of course be larger.

### *Dog Sledges.*

Dog sledges are generally used by the Esquimos of Arctic America, who apparently have lost the art of training reindeer to this work, which their forefathers in the Asiatic and European Arctic regions practised and which is still practised there to this day. The native Arctic dog of America is virtually a half-tamed wolf, which by breeding in the settlements has become sufficiently domesticated to be used in drawing sledges, but in no other work, though very valuable for that one purpose. In the English expeditions it was found that an Esquimo dog could draw from 75 to 140 lbs. according to the condition of the ice, but on very hummocky ice the difficulty of working the sledge with them was so great that they were only used as auxiliaries and for special occasions. They were employed with sledges of sizes from two dogs to seven or eight. A good example of their value on emergency was shown in June, 1854, when a seven-dog sledge brought Captain Kellett (who was ill) from the *Resolute* to the *Assistance*, 150 miles, in 24 hours.

Lieut. Payer (*Austro-Hungarian Expedition*, 1872) does not agree in this sort of condemnation of dog sledges. He employed several in his sledge expeditions about Franz Joseph Land, in teams of two and four dogs, and calculated that they could draw 2 cwt. each; on one occasion two dogs drew a sledge weighing 4 cwt. altogether, over level snow, so fast that the men had a difficulty in keeping up with them; the men, however, were worn with work and privations; and these were not Esquimo dogs, but from Vienna, and not trained to the work. He considers that Newfoundland dogs are better than Esquimo; and with them he is of opinion that dogs, or a combination of dogs and men, are better than men alone for sledge work; because a dog can draw nearly as much as a man, and does not require the equipment of a man. Now the equipment in an eight-man sledge weighs about 70 lbs. per man; and forty days' food at 2¾ lbs. per day (per man or dog), which is the allowance he thinks necessary to preserve the strength, would weigh 110 lbs. per head. Hence a sledge for four men and four dogs could carry more food than an eight-man sledge.

Dr. Kane (*American Expedition, Smith's Sound*, 1856) and Dr. Hayes (*American Expedition, Smith's Sound*, 1860) both employed Esquimo dogs. But we must recollect that in all these three last-named expeditions the vessels were small and the crews few in number, so that many could not be spared for each sledge. And when we read the records of

their journeys, the immense labour and anxiety that fell on these few men, and the trouble and difficulty created by the wildness of the dogs and their great sickness, which seems an inevitable accompaniment of severe sledge work, and the comparatively short journeys they were able to make, we feel inclined to agree with the English experts, that dogs should be looked on as accessories only, though as very valuable accessories.

One of the best examples of the use of dog sledges was in the Greely Expedition (*North of Smith's Sound*, 1881–4). That party took with them twenty-five Esquimo dogs, of whom fifteen died of disease, but were fortunately replaced by nine puppies born during the winter sojourn. Lieut. Greely recommends small sledges (five to ten dogs), fastened with thongs and not with mortices and screws, and steel runners capable of being attached at pleasure; any wood runner soon wears out on rough ice. He considers the St. Michael sledge (Hudson Bay), weighing 35 lbs., a good pattern of a small sledge; and the Greenland sledge, a long wooden one of 105 lbs. An advantage of small sledges is, that, on depositing a depot for use on returning, the dead weight of the sledge can be left behind too. He gives drawings of these sledges. This party did some long and severe work with them.

From experiments Lieut. Greely came to the conclusion that an Esquimo dog could draw one and a half times his own weight (which weight appears to be about 60 to 70 lbs.), which he says is rather more than the amount calculated on by the Hudson's Bay Company, 100 lbs.; and that their rate of travelling with this load is three miles an hour; with a light load they did six miles an hour. They were well fed, every other day, and with warmed food. The sickness they suffered from was, he thinks, brought with them. He considers that the Esquimos are not so good as white men for driving dogs; they have not the staying power.

But the use of dog sledges with only two or three men with them has this serious defect; it entails too much labour and anxiety on the leaders of the party, and a slight accident may deprive them of one-third of their strength, at a time when all are already working to their full power.

Lieut. Greely tried a *wheel carriage* in going across Grinnell Land in June, 1882, but it broke down over the rough ground.

### *Boats.*

Boats were sometimes carried on sledges, during the seasons when the ice was beginning to break or beginning to form. An ordinary ship's cutter was carried by Commander Richards across Franklin Strait in 1853; but a lighter boat, built expressly for the purpose, was carried a long way by Lieut. Osborn; and canvas boats coated with waterproof composition were used successfully; also a kind of flat-bottomed boat or tray, placed on the sledge with the cargo stowed in it, was found efficient to float the whole over a narrow lane of water.

Four light ice boats were built by Mr. Searle expressly for Sir E. Belcher; they were 16 to 20 feet long, flat-bottomed, of extremely thin boards, covered with canvas, and weighing about 300 lbs. each, and would

carry eight persons. They proved of very great service during the latter part of the sledging season, when the ice began to break up.

Several voyagers remark on the importance of having boats built expressly for ice service. Capt. Collinson recommends stout bilge pieces to be added to whale boats, as one of his in the voyage from Camden Bay to Point Barrow (July, 1854) was made nearly useless by the wear of ice and shingle. In August, 1852, on the breaking up of the ice, he made a little flat-bottomed punt, after the model of the Chinese *Sanpan*, which was much used on this occasion, and also at Cambridge Bay in 1853 (Journal, p. 228). The Sanpan (Chinese for *Three Boards;* see Col. Yule's 'Anglo-Indian Glossary') is a little boat of universal application on the Chinese coast, sculled from the stern with an oar.

### *Fuel.*

One of the chief troubles in sledge travelling was the constant extreme thirst, the cause of which is not explained; but it was of course difficult to supply the wants of ordinary thirst on such expeditions, because it involved expenditure of fuel; and therefore we find that those expeditions on which drift-wood was available were more successful as regards the health of the party. This painful thirst exhausted the men and affected their appetites on the early stages of a journey, and this reduced their strength in two ways.

The great authority on sledge travelling (Capt. M'Clintock) made some careful experiments in 1853 (with Capt. Kellett's expedition) of which the following abstracts are given by Mr. M'Dougall:—

*Experiments on Fuel.*—By Commander M'CLINTOCK.

| Lamp. | Kettle pints. | Time per pint. | | Fuel. | Temp., Air and Snow. |
|---|---|---|---|---|---|
| | | To dissolve. | To boil from Snow. | | |
| | | min. sec. | min. sec. | | |
| Argand . . . | 13 | 2 40 | 4 48 | Alcohol . | −32° |
| 5-wick . . . | 9 | 4 24 | 8 48 | „ . | „ |
| Stearine . . . | 13 | 3 54 | 10 0 | Stearine . | „ |
| „ . . . | 9 | 3 21 | 7 12 | „ . | „ |
| „ . . . | 9 | 6 0 | 16 0 | Tallow . | „ |

*Fuel for* 11 *Persons. Temp.* −32°.

| | Alcohol. | Stearine. |
|---|---|---|
| | oz. | oz. |
| To boil Tea or Cocoa (13 pints) . . . | — | 14½ |
| To dissolve Snow (10 pints) . . . . | — | 7¼ |
| „ „ (8 pints) . . . . | 6 | — |
| Supper (Preserved Meat) . . . . | 15½ | — |
| Evening Grog (10 pints) . . . . | — | 7¼ |
| | 21½ | 29 |

Commander M'Clintock found that to boil snow from —40° required twice the time to boil it from freezing point.

On the whole, therefore, we may consider that an allowance of 5 oz. per head per day (of stearine or alcohol) is sufficient for a sledge party in the Arctic Circle for all purposes: Greely recommends 6 oz. M'Clintock prefers stearine, on account of the danger of breaking the bottle of alcohol and so losing it all.

Sir E. Belcher made stearine candles or cakes for sledge use, of two parts whale oil and one part stearine, eight inches diameter, with several wicks. He also found a copper lamp (a simple cup), with six lips for wicks, very effective.

In the United States Greely Expedition (1881) they used little but alcohol as strong and pure as procurable. It was carried in two-gallon vessels, from which it was poured into india-rubber bottles for use. They used a field lamp with five wicks, in a tin cylinder, with two pots over it; with this apparatus, 4 oz. of alcohol produced 2½ quarts of water from snow at —30° in sixteen minutes, and boiled it in ten minutes more, and at the same time made 1¼ quart of water in the upper pot: which appears to be more than M'Clintock got out of stearine. Greely sensibly remarks that too quick cooking is not economical. They complained of the smoke of stearine being unbearable, but they lost some alcohol from accidents.

To meet this difficulty of fuel, Capt. Collinson made experiments with a mixture of oakum, oil, rosin, and saltpetre; ¾ lb. of this composition would thaw and boil 8 pints of snow in half an hour: 3 lbs. of it per day was enough for eight men (see Journal, p. 262).

But even with the most compact fuel (alcohol) it was often not practicable to do more than just warm the food, and sometimes it had to be eaten cold—cold in the Arctic sense, which means frozen as hard as stone. When the pemmican has to be broken in bits, and the spirits taken in a solid form, dinner becomes a practical joke rather too painful to be enjoyed. And the parched sledge-man must beware of taking snow to relieve his thirst—it only scarifies the mouth.

### *Pemmican.*

Pemmican is the most condensed form of food for Arctic travelling; originally invented by the North American Indians, it was perfected in our Naval Victualling Yards; and as manufactured expressly for this expedition by the Arctic explorer, Sir John Richardson, it consists of pure lean beef meat, cut in thin pieces and dried in a malt kiln by a fire of oak-wood till friable, then ground in a malt mill to a grated state, and mixed with equal weight of melted beef suet or lard with some sugar, and well incorporated. Put into tins of 40 or 85 lbs. when warm, and when cool filled up with melted lard, and soldered up. Three-fourths of original weight lost in drying: cost 1*s.* 7½*d.* per lb. (*From Dr. Armstrong and Mr. M'Dougall.*)

It appears to keep for an indefinite time, as long as it is not exposed to the atmosphere. Captain Nares speaks favourably of pemmican biscuits.

Commander M'Clintock's parties lived a great deal on pemmican, and he considers it the most sustaining food for hard work. Commander Richards' men asked for it on one occasion in preference to fresh venison, and he says, "I believe a man can do more work on pemmican than on any other kind of food." Pemmican, however, requires an education to appreciate it; and it has to be mixed with currants and herbs or sugar to make it go down at first. One of its advantages is, the facility of getting it into an edible condition on the march; frozen pemmican put into a pot of snow and set on the lamp produces a sort of soup quicker than any other kind of food. This must not be confounded with that delicious compound "Arctic Soup" as described in the following recipe by Mr. M'Dougall. *Recipe for Arctic Soup:* First melt your snow; then boil the water; then put into it (for eight men) eight pieces of salt beef of 8 ozs. each (and well frozen); let them simmer for ten minutes; then put in 8 ozs. of flour. Take out the beef and serve the soup while tepid.

*Seasons.*

The best season for sledge work, according to the British experience, appears to be from the middle of April to the end of May, when the ice is still firm and the temperature moderate. Before that it is too cold, and in June large cracks begin in the ice, impeding progress greatly. On good ice, fifteen miles a day can be made with a light sledge without overtaxing the men. But good ice is the exception in the Arctic sea; it is rarely that the path is not crossed by successive lines of hummocks ("Arctic hedgerows" so called) formed by the collision of floes in summer; and these are often of such height and character as to turn the march into an Alpine climb, in which the loads have to be transported in pieces, involving three and four trips over the same ground. It is work of this kind, perhaps done in a bitter freezing wind or a snow-storm, which exhausts the men and breaks their spirit, from the slow progress. To avoid these hummocks, they keep close to the shore, where the ice is generally new, that is, of one season, and therefore smoother. This is what is called "land ice," and forms a belt between the shore and the great floes, which latter are commonly stranded in shallow water at some distance from the land, that is, comparatively shallow water, for floes have been found aground in twelve fathoms. The autumn travelling was considered to be the worst; and it was only undertaken for the object of placing depots of provisions on an intended route for the use of the main parties in the spring. In the autumn the daily increasing cold chills the party; clothes and coverings get more and more damp from the condensation, and become more and more frozen into boards.

In June the snow begins to melt and produces a sort of slush on the ice which is very troublesome to sledge travellers. Sir E. Belcher speaks of the depressing effect of dragging a sledge for several hours through ten inches of water; and sometimes these lakes of melted snow on the ice are waist-deep; but such depths do not occur till July.

Lieutenant Payer (*Austrian Expedition, Nova Zembla*) prefers the autumn season for sledge work, on account of the extreme cold in the early spring, and afterwards of the thawing of the snow and the breaking up of the ice.

Lieutenant Greely (*United States Expedition, Smith's Sound*) began laying out his depots in February, 1882, and started his main parties in March; he also carried on sledging late in the autumn: the use of dogs gave him some advantage in travelling so early and so late.

### *Snow Blindness.*

Another trouble in this part of the work is the snow blindness, caused by the reflection of the sunlight from the snow, generally covering the whole field of ice; and which reflection virtually deprives men of the use of their sight for some days, and will return again if not guarded against. An intense and brilliant phase of this is when the sun is about 20° above the horizon, at which time its reflection from the snow crystals is broken up into prismatic rays, and it produces the appearance all over the ice of what is called "diamond dust." Various appliances have been invented to protect the eyes from this action; "nothing so effectual as a pair of neutral tint spectacles" (R.) A good many journeys have been made at night (that is to say, when the sun is near or just below the horizon) to avoid this glare. The time for commencing this so-called night travelling is about the end of April, and it is continued on to the end of the journey on account of the heat of the sun in midday, which is oppressive under the circumstances, though the thermometer may be at freezing point.

### *Weights and Distances.*

In the British expeditions 200 lbs. per man, dragging, was considered a fair weight, though this may be raised to 250 lbs. per man for a short distance and on smooth ice. This limits the length of journeys (beyond the depots, which are always deposited by auxiliary sledges on the route) to forty or fifty days' provisions, including going and returning, or about 400 miles altogether, the average daily march being about 10 miles. No allowance can be properly made for the lightening of the sledge by consumption of provisions, for the condensation and freezing of moisture from the bodies at night so accumulates in the wrappers, and sometimes never gets thawed and evaporated, that sledges have occasionally returned to the ship actually heavier than when they started; sometimes even with the original weight of coverings doubled.

The average time on the daily march was about eight hours, the rate of progress being therefore very slow—from one to two miles an hour; with a fair wind and smooth ice this might be doubled, but such exceptions intensify the labour of the ordinary dragging; the difference between fair and foul may be expressed by the lines of the Latin poet, referring to a more serious journey:—

"Facilis descensus Averni;
Sed revocare gradum—hic labor, hic opus est."

As the warmer temperature advanced, if we may speak so of a maximum about freezing point, the day's or night's march was divided into two, of six and four hours respectively, with an interval of rest between them, and a greater daily distance was so obtained, with less fatigue to the men. Lieutenant Payer says ten hours' sleep and seven hours' march (with good food) increase the strength and weight.

In the United States Expedition of 1881 (Lieutenant Greely), with the help of dogs, they constantly did 15 miles (geographical) a day; and, on Lieutenant Lockwood's great journey to the "farthest north," he did 20 miles a day on the average, with an eight-dog sledge, the dogs dragging about 100 lbs. each. It is impossible to make any satisfactory comparison between this journey and Commander Markham's towards the North Pole in 1876; but, judging by the records of the two journeys, the ice in Lockwood's journey must have been much more favourable than in Markham's.

*Night in Tent; on Sledge Journey.*

"The meal done, the tent was carefully swept out, the last sedulous arrangement of the pebbles, termed 'picking the feathers,' was made, and then a waterproof sheet spread to prevent our warm bodies, during the night, melting the frozen ground and wetting us through.

"Then every man seized his blanket bag, and popped thereinto his legs and body, in order that the operation of undressing might be decently performed, and placed jacket and wet boots carefully for a pillow. Lastly, the wolf-skin robes—oh, contractor of furs! may you be haunted by the aroma of the said robes for your lifetime!—brought along over and under the party, and all lie down alternately head and feet in a row, across the tent. Pipes are lighted, the evening's glass of grog served out; and whilst the cook is washing up, and preparing his things ready for the morning meal, as well as securing the food on the sledges from foxes or a hungry bear, many a tough yarn is told or joke is made. The cook reports all right, hooks up the door, tucks in the fur robe, and seven jolly mortals, with a brown holland tent over their heads and a winter's gale without, try to nestle their sides amongst the softest stones, and soon drop into such a sleep as those only enjoy who drag a sledge all day, with the temperature 30° below freezing point."—Osborn, *Arctic Journal.*

*The Start.*

The starting of a sledge expedition is a festal day in Arctic service. After the dreary confinement of the winter, the reappearance of the sun is a veritable restoration to life; and soon after that event the preparations for the spring journeys commence. The prospect of a change from the monotonous ship life, and of seeing something new, and discovering nobody knows what, gives an attractive excitement to the sailor, and every man who has strength in him is ready to go. The officers told off to command the different sledges superintend the fittings and cargo of each, providing some special arrangement according to their own ideas.

A sledge is, by the nature of the service, a sort of independent command, and in a seaman's eyes becomes for the time a ship. Each bears a name and a distinguishing flag, most of the latter having been carefully prepared beforehand by some fair hands at home.

On the appointed day for the start, which, to give importance and spirit to the duty, is generally the same for several expeditions, all the sledges are marshalled a little way from the ships, with everything stowed and flags flying; then their officers and crews are assembled, as well as those who are to remain in the ship. The commander of the whole expedition then makes an address to the sledge parties, ending with that duty, which is never forgotten by seamen, of praying to the Almighty Ruler for protection and support to their undertaking; after which the sledges slowly wend their way across the field of ice, in their several directions, with mutual cheers from each and from those left on board; "and soon the flags are hauled down, and a silent earnestness more befitting to the occasion succeeds this momentary festivity" (R.).

*Records of Special Journeys.*

Among all the numerous sledge journeys of that epoch, those of the expeditions under Captain Austin in 1851 and Sir E. Belcher in 1853 are perhaps the most remarkable. Commander Richards (now Admiral Sir G. Richards, K.C.B.), who explored the north coasts of the Parry Islands in 1853, probably travelled more than any other officer; Commander M'Clintock (now Admiral Sir L. M'Clintock, F.R.S.) made one of the longest journeys, of 1030 miles altogether, and 105 days out, reaching to the extreme north of Prince Patrick's Island, in 1853; but the journey of Lieutenant Mecham to Prince of Wales Straits, where he found a record of the *Enterprise*, was the longest in distance, being 1157 miles, and 70 days out; but in this case the weights were lighter, and other circumstances favourable.

In fact, the length of time out and the distance done depends on three conditions—fuel, ice and weather; fresh meat (from game) is a great support, but not indispensable. One of the most terrible sledge journeys ever performed, though only of six days, and of 50 miles, was by Commander Richards, in 1854, from Baring Bay (Wellington Channel) to Beechey Island. It was made in February, for a special purpose, and the temperature was always below — 40°. The men were so disabled with the intense cold that they would hardly wait for their frozen meat to thaw, and could hardly eat it when it was thawed, but threw themselves into their blanket bags, and even then could hardly sleep. It required a week's rest to recover them.

*Captain Parry*, 1827.—There were two such journeys over the ice which will always remain the most interesting, if not the most remarkable, of all performed in the Arctic seas; and those are that of Parry from Spitzbergen towards the North Pole, in 1827, and that of Markham from the north end of Smith's Sound, in the same direction, in 1876; both conclusively proving the complete impracticability of the attempt to reach

the Pole in that manner. Parry's was both a land and a water journey, for it was made in June, when the ice was breaking up. He took two boats, expressly made, with flat bottoms, and two officers and twelve men to each boat, each, when laden, weighing 3753 lbs. They got to 82° 45′ N. lat., 19° 25′ E. long., and then found that the great labour, with little result, was too much for the men. It was, in fact, too late in the season. The work of daily hauling the boats on to the floes, and launching them again, and dragging the boats over the hummocks of ice—and to no purpose, for the whole field of ice was drifting south all the time—took all the go out of them. They were forty-eight days travelling, and the direct distance, out and in, was 570 miles. But, thanks to the good arrangements, no man was much the worse.

Two curious questions arose on this voyage. One, common to all Arctic travelling, but increased as you go north, that is, the difficulty in summer time—when the sun is always above the horizon—of knowing day from night, and therefore of telling when one day ends and another begins. This was met by Parry by having prepared beforehand watches marked to twenty-four hours. The other point was that, supposing they arrived at the North Pole, if there was no land they would not know their way back again, as the Polar star, their only guide, would be over their heads. The magnetic needle, in such a situation, could not be depended on.

*Commander Markham's journey, in* 1876, was from the *Alert* (Captain Nares), then wintering on the coast, at the north-west corner of that long channel beginning with Smith's Sound. It was also in two boats, mounted on two sledges, with a sufficient crew to each to make the weight at starting 230 lbs. per man. It started early in April, anticipating that the return journey would be made afloat. But it was apparently as much too early as Parry's was too late, for during the whole way out there was nothing but solid ice, and intersected with hummocks of such size and ruggedness that the loads had to be carried piecemeal. For two miles of direct advance they went over ten. This labour, combined with the cold (down to − 40°) and the snow and fogs, used up the life of the men. They reached 83° 20′ 26″ N. lat., and then had to give in. They got back to the ship in the middle of June, with only three men fit out of fifteen. "Like Franklin's party, the men fell down and died as they walked;" the cold and the weariness and the hunger ate the life out of them day by day. What renovation could such men get by resting and feeding when "their sleeping bags were sheet iron, and the curry-powder brass"? Captain Nares came to the conclusion that 60 miles of Polar pack were insuperable.

*Other Records of Sledge Travelling.*

No. 1.

*Investigator*, October, 1850. (From Armstrong.)

(*Note.*—It must be borne in mind that the *Enterprise* and *Investigator* were not well fitted out for sledge travelling.)—Seven persons; out nine

days; 80 miles out direct; from Princess Royal Islands to north end of Straits—18 lbs. pemmican, 31 lbs. biscuit, 8 lbs. oatmeal, and chocolate. In this journey there was a want of water, from want of fuel, and consequently the men were unable to eat sufficient food. Ice comparatively smooth. Weight, 200 lbs. per man.

No. 2.

*Enterprise*, April 14th, 1852.

("Enterprise" and "Resolution" sledges: from Walker Bay to the North. Journal, p. 184.) "Enterprise" sledge.—Eight persons; out fifty-two days; 537 miles direct course travelled, out and in together. Boiled pork, 80 lbs.; preserved meat, 20 lbs.; pemmican, 54 lbs.; biscuit, 160 lbs.; potatoes, 55 lbs.; rum, 5 gallons; sugar, 20 lbs.; tea, 2½ lbs.; cocoa, 10 lbs.; flour, 12½ lbs.; fuel, 50 lbs.; dogs' food, 40 lbs. (for three Esquimo dogs which helped to draw the sledge). N.B.—They had a *cache* of provisions on Princess Royal Islands to aid (from which, preserved meat, 120 lbs.; potatoes, 26 lbs.; sugar, 19 lbs.; cocoa, 8 lbs.; dogs' meat, 84 lbs.).

*Daily Allowance.*—Morning: Cocoa, 1 pint; biscuit, ½ lb.; pork, ¼ lb. Noon: Biscuit, ½ lb.; pork, ¼ lb.; rum, ½ gill. Night: Preserved meat, ½ lb.; potatoes, ⅝ lb.; rum, ½ gill; tea, 1 pint; biscuit, ½ lb.; and either game or pemmican, ⅛ lb. N.B.—This comes to 2½ lbs. per day (without tea, cocoa, or rum), which, for eight men for fifty-two days, would come to 1040 lbs.; whereas they only had 592 lbs. altogether of food on starting. But they took more from the *cache* on their return.

This was a fairly favourable journey. Ice not very difficult, firewood plentiful; game moderate, eighteen birds, four hares; weather moderate; a few frostbites and general snow-blindness, but none of the party disabled. It was from the south end of Prince of Wales Strait to the north end, and then to eastward along the coast, and back to the ship.

Total weight of sledge, loaded, 13 cwt., or 182 lbs. per man.

The weight of the whole eight persons on starting was 1264 lbs.; on returning, after fifty-two days, it was 1205 lbs., being a loss of about 5 per cent.

The second sledge (the "Resolution," under Lieutenant Parkes) accompanied the other as far as the north end of the Strait, and there parted, making direct for Cape Providence, on Melville Island. This was a journey of considerable hardship, owing to the difficulties of the ice and the inadequacy of the party; midway across M'Clure Strait, Lieutenant Parkes was obliged to leave the sledge on account of the heavy hummocks, and at Cape Providence had to leave five of his party and proceed with two; then, just as he was on the point of communication with a party from the *Investigator*, he turned back from fear of the natives. Thus all that resolution by which he well deserved the title of his sledge, and all the privations and sufferings of his party, were wasted, owing to this slight mischance. (Journal, p. 209.)

Lieutenant Parkes appears to have been promoted not long after this voyage, and was retired as a Commander in 1875.

The weight of the party of the "Resolution" sledge on starting was 1334 lbs. On returning one man was omitted in the weighing; allowing a loss of 25 lbs. for him, as he was ill, the total weight would be 1293 lbs., and the total loss would be only about 3 per cent. for seventy-five days out, and a heavy journey.

(The "Victoria" sledge: from Walker Bay to the South. Journal, p. 204.) The weight of the party of the "Victoria" sledge on starting was 1312 lbs. On returning, after forty-eight days out, and a comparatively easy journey, the weight was 1223 lbs., or a loss of about 7 per cent.

*Enterprise*, April, 1853. ("Enterprise" and "Victoria" sledges, Journal, p. 262.)—From Camden Bay to Victoria Straits and back:—

| | |
|---|---|
| Total number of days absent .. .. .. .. .. | 49 |
| Number of days under weigh .. .. .. .. .. | 45 |
| Number of hours under weigh .. .. .. .. .. | 274¾ |
| Number of statute miles gone over .. .. .. .. | 753 |
| Average hourly rate, statute miles .. .. .. .. | 2 |
| Average rate daily made good, statute miles .. .. | 12·2 |

No. 3.

*From Belcher's Narrative and Arctic Blue-book*, 1855.

*Assistance* (Captain Sir E. Belcher) and *Pioneer* (Lieutenant Osborn), 1853.

The sledge expedition under Commander Richards, sent from Northumberland Sound to the north coasts of the Parry Islands in the spring of 1853, is one of the most remarkable for the length of it and for its organisation.

No less than six sledges were marshalled to enable one to get 500 miles from the ship. Of these, three carried 550 rations each of the regulated kind, and were each manned by an officer and ten men. The first fed the whole party for seven days' march, then deposited a *cache* of provisions, and returned to the ship; the second then fed the party for eight days further, left a depot, and returned; the third did the same, feeding the party for four days more. The other three sledges carried 320 rations each, and were manned by an officer and seven men each. One of these fed the now reduced party for six days further, left its depot, and returned to the ship. The two remaining sledges (under Commander Richards and Lieutenant Osborn) went on together for eleven days more, then Osborn returned, and Richards started alone with his full supply of rations for forty days. Each sledge in returning did some exploring to fill up the gaps left in the advance, and replenished their provisions at the successive depots left. Thus Richards was enabled to reach the north-east promontory of Melville Island, having gone over some 400 miles from the ship on the way In the previous month a depot of 1200 rations was deposited by a special party under himself with a whale-boat and light ice-boat, at Cape Lady

Franklin. The whole quantity of provisions with the western sledge party, therefore, amounted to 3810 rations each of the scale shown below.

*Scale of Victualling, North-west Sledge Expedition, April, 1853, per Man per Day.*—Pemmican, ¾ lb.; bacon, 6 oz.; biscuit, ¾ lb.; concentrated rum, 3 oz.; tobacco, 3¾ oz. among eight; biscuit dust, ½ oz.; tea, ¼ oz.; sugar, ¾ oz.; chocolate, 1½ oz.; lime-juice, ¼ oz.; pepper, salt, mustard, onion powder, 30 oz. for eight men for ten days. Fuel: seal oil or stearine, 2½ lbs. for eight, or alcohol, 28 oz. These rations were in packages, each of ten days for eight men.

*Total Weight of Sledge.*

| | lbs. | |
|---|---|---|
| Equipment .. .. .. .. .. .. | 557 | |
| Provisions for eight men for forty days | 783 | |
| Cans and cases for „ „ | 60 | |
| | 1400 | or 200 lbs. for each man dragging. |

*Notes of the Expedition.*

We have fortunately the detailed record of this sledge party by the leader himself, being some of the most valuable pages of that stupendous paper hummock, the *Arctic Blue-book* of 1855; and all who have known G. H. Richards (as the present editor has for many years) would agree that he was (and is) an admirable example of the British sea officer, having the quiet resolution resulting from careful forethought and self-confidence, the strong sense of obedience to duty, the patient endurance, and with all the cheerful adventurous spirit and the social humour which are the essential ingredients of that British species of humanity.

The plan so carefully matured was fully carried out. On this occasion the proof of the pudding was literally in the eating, for they got scarcely any game, and were therefore a fair example of the work that can be done by such parties with none but their own resources. It is difficult, however, to compare the work done with the food, because of the depots, from which the returning parties all helped themselves. The total number of miles travelled by all of them, and the total quantity of provisions at the start, will be an approximate comparison (see p. 384). But Commander Richards' journey with his own sledge, from Cape Richards to the *Resolute* at Dealy Island, twenty days and about 170 miles, is a good criterion. Two matters must be taken into account in all these comparisons, which throw an uncertainty on the result. First, the varying weight of the load, which, however, is not so much as might be supposed, as the extraordinary quantity of frozen moisture collected in the equipment adds continually to it, so that some sledges return absolutely heavier than they went out. The other matter is, that every sledge carries some sort of sail, which, as we might suppose, is used on every possible occasion, and which sometimes not only "takes charge of the sledge," as the commander expresses it, but taxes the powers of the men to keep up with it. On the

other hand, the not unfrequent struggles among the hummocks (which some one compares to a confused heap of gigantic granite blocks), and through soft snow and water, counterbalance the easy days of fair winds.

*April 10th*, 1853.—The six sledges left Northumberland Sound, and crossed over the heavy hummocky ice in the Queen's Channel to Cape Lady Franklin with a N.W. wind, the thermometer — 3°. Then they coasted along the islands on the N.E. promontory of Bathurst Island, and had some trying weather; strong winds, heavy drifts of snow, rough ice, and the thermometer — 17°; "the sledges at a little distance in the haze and drift were magnified into ships tossing about in a troubled sea." And when the air is clear the sunlight on the ice brings objects so near and the refraction is so wonderful, "that, even with our daily experience, we found distances we thought to be no more than 3 miles turn out 10."

On the promontories of Bathurst Island they saw herds of reindeer, sometimes forty near together, but very shy, and they could not stop to stalk them; plenty of hare tracks, but, alas! no hares. On the N.W. sides of these promontories the ice hummocks were very large, indicating a great expanse of sea and a prevalent N.W. wind.

*April 29th.*—They reached Success Point, the rendezvous judiciously selected by Sir E. Belcher as a central point of communication between all the ships of the expedition. They had dipped into the bays they passed, to look for traces of the object of their search; and now they crossed over to Melville Island.

*May 10th.*—On the W. side of Melville Island; "dragging heavy against the N.W. wind with snow-drifts," "began night travelling (to avoid the dazzling glare of the snow), but found it disagreeable at this early period, putting us back at least a fortnight in season."

*May 16th.*—At Cape Colquhoun, near N.E. point, Melville Island. Here Lieutenant Osborn parted, and Commander Richards went on alone, "the men in good health and spirits, though weaker."

At the extreme north point (most appropriately now called after himself) he met Lieutenant Hamilton from the *Resolute* coming to the rendezvous. And near this point he picked up some small pieces of drift-wood, pine with the bark on, "probably drifted from North America" (drift truly, but at present, who shall say where from?). Here he found plenty of good soil and vegetation.

He now determined to go down Hecla and Griper Bay to communicate with Captain Kellett, as the coasts to the west of him were all under examination from the *Resolute*. And here his troubles began: "sprained my ancle, unfortunate at this time, as I rather require it" (rather!); "but with a bandage and a bamboo I kept ahead" (the commander generally walks ahead of the sledge to select the route). Then the weather, which had never been very good, turned very bad, and forced a growl out of the lame leader: "The curse of this country is the thick weather." "I can't recommend this land (sledge) travelling, you have no sun and no compass" (the compass throughout this part of the Arctic Circle is generally unreliable). On one occasion he only got an observa-

tion of the sun "by sitting inside the tent, with the artificial horizon placed in the entrance on the bottom of a pemmican kettle filled with snow to steady it; rather difficult practice, and one which covered all hands inside with snow-drift." And, as a climax, the ice hummocks were bigger than ever, "50 feet high, and seem to have stood many thaws."

At Cape Mudge his crew were exhausted, and, as generally happens on such occasions, they could not eat. Tried to make short cuts overland across points, with the result (the ground being often now bare of snow), "never follow the land, stick to the floe."

At the head of Hecla and Griper Bay they crossed over the neck of land to Dealy Island, where the *Resolute* wintered 1852–3; and during those few days it was a continual struggle with steep hills, narrow ravines, bare and rocky ground, and atrocious weather; Sergeant Jefferies of the Royal Marines (with a correct military salute) remarked, "Just like the Kyber Pass, sir, in 1841" (in which memorable expedition he had served, in the Line). These are some of the commander's reflections on the spot: "Sleep we have been strangers to for some time, I feel myself in the evening very like an iron poker (stiff and dry?), only not so strong. Weighed, and steered wherever we could find sufficient snow somewhat in our proper direction; travelling even in the snow-drift preferable to the wet tent. Such a first of June I never witnessed, having seen many."

*June 4th.*—They got into the comfortable and kindly shelter of the *Resolute;* and the commander, revelling in the bill of fare at Dealy Island, "venison, musk ox, hare, ptarmigan," pities his comrades in Northumberland Sound chewing the cud of a "curried gull, or a steak off a walrus."

### *Return Journey.*

On the return journey the bitter cold and gloom of adversity had disappeared, but the sunshine of prosperity proved almost more difficult to bear. "I look upon the sun now as my worst enemy," because he transforms the hard snow into a deep sludge. It was difficult to find what he calls "a comfortable floe," *i.e.* hard and smooth. "Soft snow knee-deep, boots breaking up, thick weather, north wind, temperature +35° (oppressive after −17°), dug the sledge out with a shovel,"—"dragging through 3 feet of snow with 6 inches of water between it and the ice, like 4½ hours on a treadmill."

The passage across Byam Martin Straits towards the end of June was "far the worst travelling we experienced, prostrated the people," so much that he came to the conclusion that "early travelling is far preferable to June."

In a walk on Bathurst Land he "got buried up to my knees in clay and snow, and, having no shovel to dig myself out with, thought it prudent to go back." Here, again, the big hummocks appeared. "This march reminded me of travelling through a thriving churchyard of the old school; the hummocks are exactly the shape of well-made graves (of

giants, with dilapidated monuments in rock crystal), and very thick they lie." "Sometimes it took us half an hour for a few yards." "We have every variety of travelling, ice, water, sludge." "Water knee-deep (on the top of the ice, on June 30th), feet numbed, requires two hours in sleeping bag to find out you have feet; the floe was covered with a sea, and anything but a calm one, the ice hummocks standing out like lines of islands." Arriving again at Success Point (the rendezvous), "We had a choice of ground to-night, either soft snow or soft clay; chose the latter as being a novelty—reminding us of the approach to a pig-sty of a November day."

On the north points of Bathurst Island, the Bears had destroyed some of the depots of provisions, showing a quite indiscriminating taste "for pemmican, bacon, boats, oars, and flags." Throughout this part there was a succession of thick-weather days—that "curse," as he calls it, of Arctic Surveyors,—"got no angles for a long time, even taking the theodolite out and exposing it for four hours produced no change!" Could weather be denser?

By this time (July 4th) the streams were pouring down the ravines; and the saxifrage, the one universal flower within the Arctic Circle, was beginning to show its delicate pink colour, "like peach-blossom."

On the return journey they tried the plan of dividing the day's march into two parts, one of six hours and the other of four, instead of taking the whole ten hours in one march; and Commander Richards says they gained several days by it, but that it is not so good in the early part of the year, as the labour and delay of breaking up the camp twice is distressing in very cold weather.

*July 6th.*—They arrived at their last depot, Cape Lady Franklin (N.E. corner Bathurst Island), one month from the *Resolute*. And notwithstanding the hard travelling "the men were none the worse except excessive fatigue and lame feet." (It is a pity their weights were not taken on starting and returning). Here they met a party from the *Assistance*, and crossed over the Queen's Channel again, this time with boats; the ice having partly broken up, leaving lanes of water between floes, compelling a frequent landing and launching on and off the ice, during which "the wooden waterproof tray (on the sledge, under the cargo) proved good, floating the sledge across wide lanes of water."

He records a remarkable instance of the strong and sudden action of ice when in motion: "In a few moments the floe, with a boat on it, was carried 100 yards, forced up the beach, and the boat turned over 20 feet above our heads, and tossed about like a nutshell, among the broken pieces of ice twenty times her own weight,—and yet not injured, owing to her light weight and good build."

And his final opinion of the Polar ocean, north of the Parry Islands, is, "That part of the frozen sea we have passed over is rarely, if ever, navigable for ships."

On July 13th they arrived at the ship in Northumberland Sound.

It must not, however, be supposed that it is always that abominable

thick weather and hummocky ice; often there are long stretches of smooth ice over which a fine wind carries the sledge quickly, and a (comparatively) pleasant atmosphere gives life and spirit even in the world of ice and snow. Neither must the reader take the idea, from the commander's dry reflections I have selected, that he was a "growler," for his disposition is precisely the contrary, and even in the worst of snow-drifts would encourage the cheerful pluck of his crew.

*Abstract of the Journey.*

| | Days. | Maximum rate per day. | Mean. |
|---|---|---|---|
| Outward . . . . | 56 | Fair wind, 17 miles. . . | 8 miles. |
| Return . . . . | 35 | Double journeys, 22 miles . | 11 „ |
| On board *Resolute* . | 3 | | |
| Total . . | 94 | | |

Number of hours employed: Travelling, 835; resting, 1057; making cairns, &c., 290.

Total distance accomplished: 808 geographical miles.

Game shot by whole party: Deer, 3; bears, 3; seal, 1; musk ox, 1; birds, 56.

Maximum and minimum temperature: April 10th, −3°; 21st, −17°; May 18th, +40°; June 13th, +38°; July 4th, +47°.

*Abstract of all the Sledges.*

| Sledges. | No. of persons. | Days absent. | Direct distance done. | No. of rations on starting. |
|---|---|---|---|---|
| Commander Richards . . | 8 | 94 | 808 | 320 |
| Lieutenant Osborn . . . | 8 | 97 | 922 | 320 |
| "Reliance" . . . . . | 8 | 62 | 600 | 320 |
| "Success" . . . . . | 11 | 33 | 300 | 550 |
| "Lady Franklin" . . . | 11 | 23 | 220 | 550 |
| "Enterprise" . . . . | 11 | 10 | 83 | 550 |
| | | | | 2610 |
| Deposited previously at Cape Lady Franklin . . | | | | 1200 |
| Total rations at start . . . | | | | 3810 |

*Note.*—To the direct distance done must be added about one-fourth to get the actual distance passed over by the sledges on the march. The distances are taken from the *Blue-book*, 1855.

A part of Lieutenant Osborn's journey was by boat at the end of the summer.

No. 4.

*From M'Dougall's Voyage of the Resolute*, 1852–4, *and from Arctic Blue-book*, 1855.

*Resolute* (Captain H. Kellett) and *Intrepid* (Commander M'Clintock), 1853.

This sledge expedition was sent from Dealy Island (south side of Melville Island) in the spring of 1853, to search the N.W. shores of

Melville Island and of Prince Patrick's Island. It is specially interesting from having been under the charge of Commander M'Clintock, who had particularly turned his attention to improving the sledge travelling since the expedition of Sir James Ross in 1848, when the arrangements were not much different from those under Parry in 1820.

The instructions given to him by Captain Kellett were short and expressive, characteristic of that sagacious and warm-hearted sailor. "I am glad to have at my disposal an officer of your experience and tried zeal" (he had been with Captain Austin's Expedition in 1850–1, and had reached Melville Island then). "The object of your journey is the most extended and persevering search for our missing countrymen." Then follow general directions as to his course, and a reference to the Admiralty instructions, directing the detached travelling parties to bear in mind the combined purpose, of the search for traces of Sir John Franklin, and for depositing notices—of provisions, etc.—which might be useful to the ships under Captain Collinson and Commander M'Clure, coming from the direction of Behring Strait; and enjoining them to return to the ships before the usual period of the breaking up of the ice.

"You will name on your skeleton chart all capes, bays, islets, etc., if possible, from something characteristic of themselves. And on the same chart you will lay off daily the true course you have been steering, and the estimated distance you have marked, leaving for your return the correction of this dead reckoning by the astronomical observations you may be able to obtain, without sacrificing time that might be occupied in marching. . . . . Yours is the most important direction for the search."

Two sledges started on this expedition. One under Commander M'Clintock, with ten men, reduced to eight after twenty-eight days, and weighing at the start altogether 2280 lbs., or 228 lbs. per man dragging. The other under M. de Bray, a French naval officer, who volunteered for this service, with eight men, and weighing 1784 lbs.

*Scale of Victualling, per Man per Day* (From M'Dougall.)—Pemmican, 1 lb. or ¾ lb.; bacon, ½ lb. or 1 lb.; biscuit, ¾ lb.; concentrated rum, ⅔ gill; tobacco, ½ oz.; potato, 2 oz., or biscuit dust, 1 oz.; tea, ¼ oz., sugar for do., ½ oz., two days out of three; chocolate, 1½ oz., sugar for do., ½ oz., or ship's chocolate, 1 oz., and sugar, 1 oz.; curry and onion powder, salt, pepper, patent soup. For fuel, see Commander M'Clintock's experiments, p. 371.

*Equipment of a Sledge for One Officer and Seven Men.*

| | lbs. |
|---|---|
| 1 tent complete, 11 ft. × 7 ft. × 7 ft. high . . | 34 |
| 4 tent poles (boarding pikes reduced), 8½ ft. long . | 22 |
| 1 sledge complete, drag ropes, &c., 11 ft. × 3 ft. × 1 ft. high . . . . . | 115 |
| 1 canvas boat . . . . . | 20 |
| 2 sheers, 12 ft. long (bamboo) . . . . . | 15 |
| 1 yard for sail (bamboo) . . . . . | 8 |
| Carried forward . . . | 214 |

*Equipment of a Sledge for One Officer and Seven Men*—continued.

| | lbs. |
|---|---|
| Brought forward | 214 |
| 1 sail (No. 7 canvas), 12 ft. × 9 ft. | 14 |
| 1 mackintosh floorcloth | 20 |
| 2 buffalo robes, 12 ft. × 8 ft. | 56 |
| 8 sleeping bags (felt) | 50 |
| 2 cooking apparatus | 34 |
| 1 bag sundries | 16 |
| 1 medicine box | 5 |
| Luncheon haversack, pannikins | 8 |
| 1 double-barrelled gun and gear | 10 |
| 1 shovel | 5 |
| 1 pickaxe | 9 |
| 8 knapsacks (spare clothes) | 144 |
| 1 Canadian axe | 3 |
| 1 ammunition bag | 12 |
| Instruments | 12 |
| Total | 612 |

*Clothes for Sledge Travelling, per Man.*

| Whence supplied. | In wear. | Spare. |
|---|---|---|
| *Supplied by Government:—* | | |
| Woollen drawers | 1 | ½ |
| Box-cloth trousers | 1 | — |
| Woollen frock | 1 | 1 |
| Welsh wig | 1 | — |
| Seal-skin cap | 1 | — |
| Blanket foot wrappers, 14 in. square | 1 pair. | 2 pairs. |
| Boot hose, heeled | 1 „ | 1 „ |
| Canvas boots | — | 2 „ |
| Deer-skin moccasins | 1 pair. | 3 „ |
| Woollen grey mitts | 1 „ | 1 „ |
| Seal-skin mitts | 1 „ | — |
| Muffler | 1 | — |
| Spectacles | 1 pair. | — |
| *Supplied by Men:—* | | |
| Woollen shirt | 1 | — |
| Sleeved waistcoat | 1 | — |
| Duck coat | 1 | — |
| Heeled stockings | 2 pairs. | 2 pairs. |
| Mitt socks | 1 „ | 1 „ |
| Comforter | 1 | — |
| Duck trousers | 1 pair. | — |
| Face protector | 1 | — |
| Towel and comb | — | ½ |
| Soap for party | 1 lb. | — |

Sir E. Belcher says the seal-skin articles were badly cured; and the box cloth things did not fit; and the felt articles were not of good quality; and on the whole that more care was desirable in the selection of the clothes and equipment for Arctic service.

*Notes of the Expedition.*

April 4th. Left the ships at Dealy Island, and crossed over the land to Hecla and Griper Bay; having to get the aid of thirty-nine men altogether to drag one sledge up the steep hills (which bothered Richards so much in crossing the other way).

Like him, M'Clintock is pleased at getting on to the ice from the land; a smooth transparent ice in that part of the bay; he began night travelling on April 21st, much sooner than Richards, and with a lower temperature too, —24°. He coasted up the west side of the bay, finding ice hummocks and gravel mounds (60 ft. high!) on the beach as he got northwards.

May 2nd. Parted with his companion sledge, being then on the west coast of Melville Island; and with twenty days' provisions (and eight men) went on alone across to Prince Patrick Island; "load greatly lessened": the other sledge returning to the ship. Now the snow began to soften, and from this time the dragging became heavier and heavier: he was clear, however, from Richards' abominable thick weather, for in Fitzwilliam Sound it was "delightful, though cold."

Returning to his depot on Melville Island, he crossed again and went to the extreme north of Prince Patrick's with fifty days' provisions, a heavy load. Here he found great earth mounds on the beach, and marks of heavy ice pressure, evidences, like those on Melville Island, of an extensive sea to eastward. And two miles outside the little islands off this north point, "a tremendous pack resting on the ground." Thus answering to the description of the pack off Banks Island by M'Clure, and of that off the north of Greenland by Nares, and of that off the north of Spitzbergen by Parry: all marks of a large ocean.

June 17th. He reached the south of Satellite Bay on the west coast; and now the snow began to thaw in earnest, and the ice—which had begun to crack in May—had pools of fresh water on it. This was a pleasant change in one respect, as they got water to wash in, a rare luxury in sledge travelling, though a painful one: for when faces are "coated with dirt, blistered with sun, and bitten by frost," even washing has its drawbacks.

On the west coast he found many small pieces of drift-wood much worn; no doubt from the same source as those found by Richards on north point of Melville Island; but what source? The flood tide and the prevalent currents come from the westward on to Banks Island and Prince Patrick's Island, and the currents from the west along the coast of North America turn up the west coast of Banks Island and up Prince of Wales Strait; but there is no evidence at present that they cross M'Clure's Straits. No drift-wood is found along the north side of Melville Sound. M'Clintock got back to his ship July 17th.

*Abstract of the Journey.*

| | Days. | Maximum daily rate. | Mean rate. |
|---|---|---|---|
| Outward. | 75 | Fair wind, smooth ice, 17 m. | 10·4 geographical miles. |
| Return | 30 | „ „ 21 m. | |
| Total | 105 | | |

Number of hours employed: Travelling, 860; resting, 1403; lunch, 44; detained by weather, 167; cairns, &c., 49.

Total distance accomplished: 1030 miles.

Gone over by sledge: 1210 miles.

*Temperature.*—Mean of Weeks: April 12–21, −4°; April 21–May 3, −2·74°; May 3–10, +2°; May 10–31, +16·5°; June 1–6, +25°; June 24–July 1, +32°; July 9–15, +36°. Maximum: July 4, +51°; wind S.E. Minimum: April 16, −24°; wind N.W.

| | | Musk Ox. | Deer. | Hares. | Seals. | Birds. | Total. |
|---|---|---|---|---|---|---|---|
| Game | Seen | 94 | 124 | 2 | 18 | 215 | — |
| | Shot | 7 | 8 | 2 | 0 | 29 | 1629 lbs. (M'Dougall.) |

No traces of bears, and no animals north of 77° lat. This favourable supply of game, very different from Richards', enabled him to be more liberal with his rations, and to allow latterly 1½ lb. of pemmican daily. He speaks of the excellent effect on the men of this extra allowance.

No. 5.

*Austro-Hungarian Expedition*, 1872.

Lieutenant Payer recommends tea, and condensed milk, and coffee, on a sledge journey, as "indescribably refreshing." He found that a large amount of animal food produced thirst, and irritation, and weakness. He had an assortment of nationalities to deal with: German, Dalmatian, Tyrolese, Swedish and Esquimo.

No. 6.

*United States Expedition*, 1881, *to the "Farthest North."*

This expedition was the result of the International Conferences held in 1879 for the object of establishing a series of synchronous observations round the Polar Circle. The United States undertook the work at the station of Lady Franklin Bay, north of Smith's Sound; and the signal department of the United States Army had the responsibility of all the arrangements. A party of twenty-four officers and men, all of the United States Army, were taken in a hired steamer to Lady Franklin Bay in 1881, and left there with the materials for building a hut and provisions for two years. During that time they not only made the required scientific observations, but explored with dog sledges in various directions. This novel plan of carrying on Arctic work was, as far as concerns science, very

successful; the great sufferings and losses of the party were due to bad management elsewhere. The success was due mainly to the good qualifications and character of the men composing it, and to the sagacity and management of the commander, Lieutenant Greely, U.S.A. (now Brigadier-General), and on the whole it offers an example of Arctic enterprise worthy of further elaboration; there is, however, this objection to the hut plan, that you cannot possibly get away in it. Of the sledge expeditions made, that by Lieutenant Lockwood to the north of Greenland is the most interesting, both as a sample of sledging, and because it reached the farthest north yet touched by man; but being along the coast the whole way it does not belong to the same category as the adventurous exploits of Parry and Markham direct into the Polar Sea.

*Lieutenant Lockwood's Expedition, North Greenland.*—Sledges.—One eight-dog sledge carrying 800 lbs. altogether; dead weight, 256 lbs.; food, 227 lbs.; dogs' food, 300 lbs.; with three men (one of them Esquimo). Four auxiliary sledges (Hudson Bay pattern) drawn by ten men altogether, each dragging about 200 lbs.

The party started April 3rd, 1882, across Robeson Channel to Greenland, and at Cape Bryant they left the auxiliary sledges, and Lieut. Lockwood and his two companions went on alone with the dog sledge, and succeeded in penetrating along the North Greenland coast up to lat. 83° 23′ 8″, the highest latitude yet achieved by any person.

They returned to Fort Conger (the permanent station) June 1st, having been absent sixty days, during which they had made forty-six marches and had gone over 928 geographical miles, the direct distance being about 500 geographical miles, being an average of twenty miles of ice traversed to a march; the rate was 2·1 miles per hour going, and 2·3 returning.

There was plenty of rough ice, but on the whole the travelling appears to have been tolerably good in respect of that important particular; though the view given of what is facetiously called "The Arctic Highway" (taken from a photograph) looks like a stone quarry covered with loose blocks, piled house-high. From their extreme northing, looking sixty miles to seaward, there was rubble ice, but no huge hummocks such as were found on the coast to the westward: a condition of ice which seems to imply more land to the northward.

Considering the temperature and the rate of travelling, it was a very fine example of sledge work, and encouraging in the employment of dogs. That they returned in good condition, both men and dogs, was due, first to the character of the men, but also to the plentiful supply of food; besides the auxiliary sledges, there were depots of provisions planted beforehand, and also some depots left by former expeditions on the Greenland coast. Lieutenant Lockwood thought that with a lighter sledge he could have got farther; he made the attempt in March, 1883, with two sledges of ten dogs each, but was soon stopped by the totally unexpected obstacle of open water. The direct distance accomplished in 1882 (about 250 miles out) was not, however, large for Arctic sledge work.

*Food.*—The feeding recommended by Lieutenant Greely for sledge work

was as follows: Meat (pemmican 11 oz., rest bacon and game), 22 oz.; bread, 10 oz.; butter, 2 oz.; vegetables, 4 oz.; sugar, 2 oz.; tea, chocolate, 1 oz.; condensed milk, 1 oz.; and canned fruits in the depots, as a change. Lime-juice in frozen lozenges, very refreshing. This excels the British scale chiefly in vegetables, butter and milk; he lays great stress on the canned fruits.

No. 7.

*Dr. M'Cormick, R.N., Surgeon in H.M.S. North Star, Expedition* 1852–4 *(now Deputy Inspector-General, retired).*

This officer published in 1884 two volumes containing his experiences during the above expedition; and also on the expedition by Captain Parry in 1827 to Spitzbergen, and on that to the Antarctic Seas in 1839–43, under Sir James Ross, in which he served as Naturalist and Geologist, as well as Surgeon. They contain, therefore, the record of a considerable Polar experience, and have besides the special attraction of a large number of clever sketches of Polar scenes by the author himself; of which those in the Antarctic Seas are particularly valuable.

On matters connected with the subject of the present book, Dr. M'Cormick gives a curious example of improvised shelter in snow travelling. While on a short land journey in the neighbourhood of Beechey Island, he and one companion, with two dogs, found themselves, by bad weather, cut off from their party, and compelled to remain all night without covering or food; with their knives they cut a trench in the snow two feet deep, in which they and the dogs lay all night, covered only with the coating of snow drifted over them; and, although there was a gale of wind with the thermometer at −32°, they had not even a frost-bite.

In the matter of diet in the ice, Dr. M'Cormick recommends preserved tin meats and vegetables and bottled fruits, especially cranberries; but not dried fruits; and malt liquor in preference to spirits.

He gives a recipe for *Quinine Wine*:—

1 scruple of quinine in 1 scruple of citric acid, in a wineglass of water, added to a bottle of port or sherry.

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The latitude of the farthest point North reached by Lieut. Lockwood stated in the above note, and also at p. 21, is that given in Lieut. Greely's account of the expedition; but in the official report of the expedition it is stated that "the mean 83° 24′ is believed to be the latitude attained by Lieut. Lockwood."

## Note 25, p. 247 : ARCTIC WINTER ON BOARD SHIP.

*Housing the Ship* sounds a comfortable operation to the inexperienced, but to the Arctic voyager it bears a dismal import, signifying the absence of the sun for some months, and continual night for a part of that time. Every Arctic narrator bemoans this loss as the greatest deprivation of all the joys of civilised life in the dark north, and as a primary cause of the *mala mens in malo corpore* which comes from Arctic voyaging. Captain Collinson, when asked on his return what was the greatest privation he had felt, replied at once, "The absence of daylight." Sir E. Belcher (coming, however, to it in bad condition) says: "In this climate, under the insidious effects of close confinement, absence of light, and, still more important, of the wonderful influence of the sun's rays, nothing but strong determination will keep a man in good health."

The *Enterprise* (when in Walker Bay, 1851–52) lost the sun for 67 days; in Cambridge Bay for only 39. About Beechey Island it disappeared for some 90 days; in Northumberland Sound for more than 100; but, on the north coast of Greenland, Captain Nares' expedition in 1875 saw no sun for more than four months. No wonder that the melancholy operation of shutting out the last days of light is postponed as long as possible.

For the first part of this operation (after the masts and sails have been well secured) was to cover the upper deck with a roof of felt, from 12 to 15 feet high, in the centre of the deck, and sloping to 6 or 8 feet at the sides, so as to throw off the snow as much as possible. Then the hatchways were battened down, two or three smaller openings only being left to the lower decks; and the upper deck was commonly covered all over with a foot of snow, with a layer of gravel on it to make a hard surface; so that from that time they lived below by lamplight. Sir E. Belcher turned his ingenious mind to the improvement of this winter housing arrangement. The great discomfort and danger about it was the condensing of the moisture, which fell in drops and streams from the woodwork, or froze into icicles and hoar-frost in all holes and corners, bringing out all the diseases latent in each body, and scurvy over all.

Captain Belcher tried to remedy this in two ways. First, by checking the inflow of the outer air below decks, that of course being the condenser of the moisture; and, notwithstanding the "housing," the temperature of the upper deck was generally the same as the outer air, so that, every time any one passed through the openings from below, a rush of this bitter atmosphere came down, creating always a cloud of steam, and sometimes even a home-made shower of snow. Belcher built cabins of wood and two thicknesses of canvas, over the openings, and covered passages from them to the gangway, and down the accommodation ladder

to the ice, so that the cold air had to traverse these passages before it went below.

Secondly, in order to draw off the foul air, he placed the various stoves under the hatchways or openings, and carried up a large tube round each funnel up to the "housing," thus providing a direct and warm channel for its escape. The main stove for heating the ship was "Silvester's," which he condemns as expensive in fuel and inadequate; its principle was heating air, which was conveyed about the decks in pipes, but these pipes, being generally nearly horizontal, carried the warm air but a short distance. To improve this he placed the stove in the lowest part of the ship; and over the upper mouths of the above escape tubes he made chambers for the condensation of the moist air, a sort of hoar-frost catchers. The effect of these arrangements is noted by him at the end of January, 1854 (when they were more completely carried out); the temperature of the outer air being −57° (a very low mark for that latitude); the upper deck was −29°; the captain's cabin +40°; the main living deck +45°; the gunroom +50°; and between decks was comparatively dry.

But there is evidently room for improvement in the matter still, for, in the winter of 1875–76, Captain Nares says the difference between the outer and inner air in his ship was 55° in October, and still "the moisture between decks is the most troublesome thing"; and his ships were warmed with hot-water pipes, "which diffuse the heat well."

Belcher recommends the cabins to be placed amidships, and the stores along the sides; but that implies a radical reform in a ship's constitution. The ship's sides were always protected with extra planking outside and inside, and felt lining (Parry had cork lining in 1820), but the penetrating power of the cold may be comprehended by Captain Nares' remark that the floating of his ship in water (and not cradled on ice) kept their engine-room at +28°. To counterbalance this penetration a bank of snow several feet thick was always made round the hull outside.

In the *Enterprise*, in 1851–52, an improvement was made in the felt housing by the introduction of glass windows as soon as the sun re-appeared; so that a little daylight was thrown into the cabins, at a time when it would not have been safe to dispense with the housing altogether. And another useful application of glass was made with good effect, by fixing double sashes to the skylights of the cabin, which could therefore be kept open to daylight for a longer period than was possible with a single sash.

Lieutenant Payer mentions that in a small vessel (the *Tegethoff*) there was a great difference in the temperature inside the cabin, that at the floor being +1°, while at 6 feet high it was +22° (Réaumur).

*The Greely Expedition* (1881–84) struck out a new line in Arctic travelling, by constructing a regular wooden hut, double boarded and covered with tarred paper, in which the whole party (25) lived two winters in lat. 82°. The chief advantage of it appears to have been in the total absence of the condensed moisture, which is so great a trouble on board ship. The heated air escaped at once into the roof space, and from

that somehow into the open air, as it did not even condense in the roof. But it must be recollected they had a good supply of fuel, having a coal mine within a few miles of the hut. On the whole, it appears to have been more healthy and more agreeable than the lower deck of a ship; arising, no doubt, in a great measure from its interior being more open throughout, and not divided into little cabins.

*Winter Occupations.*

With the departure of the sun go all out-door excursions; daily exercise in the open air becomes a duty, and not an attractive one, along a worn track in the snow, sometimes only lighted by the reflection of the stars from the white covering around. But at the beginning and end of the dark season there are times of great splendour, when the refracted light of the invisible sun illuminates the sky with rich and warm colours. The aurora frequently displays its vivid coruscations, but these are more of scientific interest than of value as light. The chief source of light during this season is the moon, that "presiding goddess of the Arctic winter," as Captain Nares calls her, and when she is above the horizon her refulgence is sufficient to give a sort of life to the solemn silence of an Arctic scene.

*The Arctic Night.*—"Imagine yourself, reader, on the heights of Griffith Island, on the edge of a lofty tableland, which, dipping suddenly at your feet, sloped again to a sea of ice at a distance of some 500 feet below; picture a vast plain of ice and snow, diversified by tiers of broken-up ice and snow wreaths, which, glistening on the one side, reflected back the moonlight with an exceeding brilliancy, whilst the strong shadow on the farther side of the masses threw them out in deep relief; four lone barques, atoms in the extensive landscape; and beyond them, on the horizon, sweeping in many a bay, valley, and headland, the ghostly coast of Cornwallis Island, now bursting upon the eye in startling distinctness, then receding into shadow and gloom, and anon diversified with flickering shades, like an autumnal landscape in our own dear land, as the fleecy clouds sailed slowly across the moon; that moon, so sharp, so clear, the while riding through the heaven of deepest blue, richly illuminated by the constellations of the northern hemisphere." (Osborn, *Arctic Journal.*)

It is the long continuity of the obscurity that produces the depressing effect, for the darkness is never like the black gloom of a mine. (Nares.)

On midwinter day at noon (lat. about 72°) we could just read type similar to the leading article of the *Times.* (M'Clintock in *Arctic Manual.*)

At Melville Island, "up to the shortest day of the year, the return of each successive day was very decidedly marked by a considerable twilight for some time about noon; that on the shortest day being sufficient to enable us to walk about very comfortably for nearly two hours. There was usually a beautiful arch of bright red light in the southern horizon for an hour or two." (Parry, 1819, in *Arctic Manual.*)

Mr. M'Dougall (*Resolute*, 1852) speaks gratefully of the cheering effect

of the moon in winter, which in those latitudes gave them the full benefit of her beautiful light, remaining above the horizon for eight days and nights every month during the winter.

Lieutenant Payer speaks strongly of the necessity of *occupation* and of *discipline* during the imprisonment on board.

Lieutenant Greely appears to have felt greatly the importance of *discipline* in Arctic service, and of continuous occupation. Even under their favourable circumstances during the first winter the gloom and absence of interesting occupation affected the tone and condition of the party. And, what was very remarkable, the two Esquimos they had brought from Danish Greenland were more affected than the white men; they had less resources in themselves. Imprisoned by the darkness, his party looked to the sun to release them, and the very turning of the winter solstice produced a change in them for the better. And yet they appear to have done more out-door work during the winter than almost any other Arctic travellers.

Like other Arctic travellers, he expresses their gratification at the light on the southern sky heralding for many days the reappearance of the sun by luminous arches of the prismatic colours, growing brighter, until the red orb itself rose above the horizon.

### *The Theatre.*

All life, animal and vegetable, disappears; the last living creatures to depart from the *Enterprise* (as also from the *Investigator*) were two ravens, who thus confirmed their ubiquitous and enduring nature. The Arctic voyager may then say with truth that they

"Leave the world to darkness and to me."

It is then that there comes out with very strong effect the genial comradeship of the British sailor, and turns that solitary little house of life into a veritable English home. It was the kind and thoughtful disposition of Captain Parry, the first to dare the Arctic winter in his ship, which gave the tone to all the subsequent arrangements. The work of keeping the ship sweet and clean, always so methodically carried out on board ship, occupies a good part of every dark day, besides the scientific observations which have been carried on all the twenty-four hours, and for which a wooden house is generally built on shore, warmed by a special stove. After dinner, which alone marks midday, come exercise, recreation, and instruction, towards the two latter of which the officers give valuable and well-appreciated assistance; but it is remarkable that none of these endeavours tell so well on the tone of the men, or rouses their co-operation so much, as the theatricals; this raises a deep subject for the consideration of ethnographers when discussing the generally supposed dull and unsocial character of the true Briton. Arctic writers all agree that no contributions given at home towards these undertakings produced more valuable results than those for the dramatic performances, and it must be allowed to be a sign of strong vivacity in the British sailor to be able to

produce something that gave interest and amusement to themselves and their officers during two or three months when everything was carried on by lamplight, and the means and appliances were few and far from appropriate; and all of it under a climate such, that it was advertised in the playbills, as a peculiar attraction, that "the temperature will be kept at 42°," *i.e.* not lower, for 42° is a temperature we should sometimes be glad to feel in a London theatre.

*Ship Arrangements in Winter.*

"The upper deck was covered from stem to stern-post with a thick felt awning, fifteen feet high in the centre, and carefully secured down to the gunwale all round the ship. There were two doors with porches, so that the lee one could always be used. The decks were carefully cleared for exercise, and lighted sparsely with common-fat lamps with canvas wicks—pork fat, bear's grease, or whale blubber being indiscriminately used, but with the greatest economy. The lower deck and cabins were, of course, constantly lighted with candles and oil lamps; and the ladder-ways were only left open for ingress and egress, but carefully secured with double doors, well weighted, to close immediately upon persons going up or down. The sides and upper deck of the ship were carefully covered over with snow as a non-conductor, and no apertures left open in bull's-eyes or skylights, except such as were thoroughly watched and under control for ventilation. Let us suppose that the breakfast-time has arrived, about 8 a.m. The hammocks have been carefully stowed away, the necessary ablutions performed, and the savoury incense of Her Majesty's allowance of chocolate rises in a vapour, fore and aft, from all the mess tables: a pint of the invigorating beverage and a biscuit and a half constitute the meal; and, from the jokes and merriment heard on all sides, you can vouch it to have been a satisfactory one. This over, we observe a general pulling on of warm clothing, and the major portion of officers and men proceed on deck, the rest clean and clear up between decks, search for and remove lumps of ice formed in cold corners during the night by the condensation of the breath of the sleeping crew, and they arrange for the next meal of noonday. At a proper time a general muster takes place, called divisions, followed by prayers. Officers carefully inspect the men and every part of the ship to see that the former were properly clad, and the latter properly clean, and then all hands disperse for a couple of hours' light duty—duties which the wisdom of Captain Austin confines to taking gentle exercise, supplying ourselves with pure snow to melt into water for drinking purposes, and keeping a hole open through the floe so as to obtain sea-water in case of a fire on board the ships. Exercise at this severe and monotonous season was really a trying operation, but imperatively necessary, as we all learnt by experience. Knots of two or three persons would dash out with their faces covered and try a stretch to Griffith Island; but, in general, a good walk under the shelter of our ships was preferred, the moon and stars lighting our midday exercise." (Osborn, *Arctic Journal.*)

*Christmas.*—The genial sailor in a climate which requires nearly double even that good allowance of animal food he is accustomed to at home, was not likely to fail in honouring the great annual winter festival after the custom of his forefathers. All the culinary talent of the ship was brought into play to convert salt pork, and pemmican, and preserved meats and vegetables, with a fair allowance of flour and currants and dried fruits, into a banquet, which, in respect of appetite at all events, surpassed a Lord Mayor's feast. Some special delicacy was always secreted by somebody to rejoice the stomachs of the disheartened with an unexpected memorial of an English Christmas. The writer of this recollects supplying Captain Kellett in 1852 with a complete preserved dinner from Messrs. Fortnum and Mason, to be brought out on some such occasion, but apparently little needed, judging by the following bill of fare at the Christmas dinner, in the gun-room of the *Resolute* in 1853:—Musk ox beef, venison, ptarmigan, ham, preserved meat, oxtail and hare soup, preserved salmon, green peas, parsnips, preserved potatoes, plum pudding, mince pies, apple and cranberry tarts, cheese, almonds and raisins, gingerbread, and, *finis coronat opus*, some really good "ship-brewed beer."

*Recreation Rooms.*—It was the practice to construct places where the men could enjoy such games as skittles and bowls, protected somewhat from the extreme bitterness of the outer air. In the *Assistance*, in 1853–54, they built a room 80 feet long and 20 feet broad, of ice blocks 9 inches thick, with windows in the walls 3 feet by 2 feet, each of one piece of clear ice; "they could cut their panes to suit their openings;" and roofed with timber and felt or canvas. This, being one of the largest of these ice houses, was justifiably named the Crystal Palace. At Melville Island in 1852–53 the *Resolute* built a wooden house on shore, which was also intended to be a permanent store depot; and which in 1854 was found to be still in good condition, "owing to the good pitch of the roof;" and probably is so to this day.

The billiard room and table made by the *Enterprise* in the winter of 1852–53 was a further advance, and appears to have been a very successful one. Its ingenious construction (given in the Journal, p. 249) is worth the consideration of future Polar voyagers. Any occupation which helps to keep the muscles in action and gives the mind employment, however simple, adds immensely to the resources of a Polar expedition; its bodily effect, however valuable, is small compared to the mental benefit of checking that despondency and morbid isolation of thought which seems to spring up like a fungus in the absence of sunlight and without proper food.

### *Scientific Observations.*

*Tides.*—This is one of the most ordinary observations made by voyagers, but in the Arctic seas is by no means so easy of accomplishment. A hole has to be cut and kept open in the ice, and this requires such continual care that it had often to be abandoned; then it is not always easy to fix a tide pole in a manner that will secure due registration; it must be recollected that the ice itself rises and falls to some extent with the

tide, and, therefore, the pole must be independent of the ice. This circumstance induced Sir E. Belcher to try to use the ship itself (which, of course, rose and fell with the ice) as a tide gauge, but it was not very successful.

*Firehole.*—An open hole in the ice to the water has also to be preserved during the winter, to provide water in case of fire on board the ship.

*Temperature of Snow.*—Sir E. Belcher, in May, 1854, buried some thermometers in a bank of snow that had accumulated near the ship. The first set were from May 3rd to May 13th, one a foot below the surface, and the other 3 feet lower and on a level with the ice. The former gave a minimum register of $+2°$, the latter of $+14°$; the air during the time having a minimum of $-19°$ and a maximum of $+18°$. May 24th : A thermometer 1 foot below the surface of the snow registered a minimum of $+8$, and 3 feet below the surface of $+16°$; the air having a minimum of $-11°$ and maximum of $+28·5°$. Thus it appears that 1 foot of snow gives an increase of temperature of about 20°, and 3 feet of snow an increase of about 30°, which will help to explain the remarkable growth of plants under the snow in high latitudes.

## Note 26, p. 250 : HEALTH.

In the voyage of the *Enterprise* the captain was attacked by scurvy in the first winter (1851–52), which showed itself by pains in the joints and black marks on the skin and soreness of the gums. During his sledge expedition in the spring of 1853, the severe toil and anxious care brought it out again; he had found that lime-juice relieved the complaint, but they had none on that sledge journey. Lime-juice is an acknowledged remedy, but the presence of scurvy does not appear to depend on the want of that article, but rather on hard labour and anxiety of mind. This question was discussed by a committee of naval officers on the return of Captain Nares' expedition in 1877. His sledge parties suffered from this pest more than any others, and had no lime-juice. On the other hand, M'Clintock, Richards, and Rae carried no lime-juice in their sledge expeditions, which were all long and heavy, and had no scurvy, not, at least, of any consequence. Captain Nares' own opinion was that the chief cause of the terrible condition of his parties was the very severe work (in, we may add, a most depressing condition of weather), and the absence of fresh meat. But again we find that the *Investigator's* crew in 1852–53 had no sledge work at all, and a fair supply of fresh meat from game, nevertheless scurvy began in the spring of 1852, and by the spring of 1853 every man in the crew was more or less scorbutic. They had, moreover, other troubles; they were obliged to be put on two-thirds ordinary (Arctic) diet in the winter of 1851–52, in consequence of a considerable loss of preserved meat (from the tins being broken); and in the winter of 1852–53 the officers even had to fall back on ship's rations, and the feeding of the crew may be judged by Osborn's fanciful description: "Breakfast, cup of weak cocoa and small piece of bread; dinner, ½ lb. salt meat and bread; supper, a cup of weak tea." Both those winters were particularly severe in the Arctic seas; and they appear to have suffered exceptionally from the condensed moisture between decks. And, lastly, the spirit of the men became depressed by the apparent hopelessness of the prospect before them, they being ignorant of the arrival of Belcher's expedition. The totally unexpected appearance of Lieutenant Pim from that expedition, in the spring of 1853, acted like a charm on the condition of the crew; nevertheless, when they arrived at the *Resolute* there were only four men fit to remain another winter. There, however, the feeling of being rescued, together with the better food and light work, restored them to even a better condition than the *Resolute's* own crew.

The bodily effects of this disease are to induce stagnation in the blood, which acts on the whole system, the teeth become loosened, the gums and palate black and sore, the flesh softened, and the whole animation

reduced (M'Dougall). We cannot, therefore, be surprised that the mind is also affected, and also that, conversely (as Parry observed), the passions of the mind produce an astonishing effect both in inducing and in removing scorbutic symptoms.

When we compare all these records and opinions, we cannot but come to the conclusion that the condition of the mind has more to do with this scourge than either food, or work, or climate. That is to say, scurvy will come from inefficient feeding, or too hard work, or damp and cold; but, if there is a healthy condition of mind, it will not be severe, and will soon be removed. The *Enterprise* was a longer time in the ice on her own resources (a materially mental point) than the *Investigator*, but her crew never seem to have lost the tone proper to the enterprise they were engaged in, that of searching for their missing countrymen. And if it had seemed right to their captain to turn back again from Behring Strait in 1854, and re-enter the Ice Gate, it is tolerably certain, from all that was known afterwards, that his crew would have joined heartily in his feeling.

The insidious disease, however, never left the captain. Thirty years after his return it was still in his system, and so affected his teeth and gums that it finally exhausted his powers, from inability to get nourishment enough to meet his daily work.

It is not so much the intense cold that affects the white man in the Arctic seas as the wind and wet. Nares says (1875, lat. 83° N.), "Dry cold—healthy crew." In a wind, −30° F. is the lowest temperature bearable; and in March, 1876, he registered −74° F. "In a wind, covers for the face are no good, they collect the moisture which freezes on them; blinkers to windward are the best protection. In frost-bites, the circulation should be restored gradually, and the best mode is to rub the part gently with the bare hand. In calm weather hands can be exposed without danger (for some time) with a temperature of −18°." In 1819 (the disastrous land journey of Franklin, Richardson, and Back, down the Coppermine River) it is recorded, "Thermometer −57° F., but calm; no protection required for the face; and ordinary Arctic clothes sufficient; although trees were frozen through, and the chronometer stopped from the intense cold."

On the voyage home, in 1855, the captain of the *Enterprise* expresses his gratification and his surprise at the remarkable health of his crew during those five years of extreme variation of climate and circumstances. In the year 1854, the third in Arctic seas, and which was begun in the ice and ended in the tropics, the average sick-list was 5·4 per cent. of the crew, a small number considering that those three years they had no opportunity of invaliding or exchanging men. Out of the seventy-one men they had on board from first to last, that is between January, 1850, and May, 1855, six died, but none of these from the effect of the climate or work alone, but in consequence of accidents or diseases unconnected with the voyage.

There were, however, some men mutilated in their limbs by the action

of frost, and probably several who suffered in after years from the effects of having had scurvy on this voyage. But on the whole, notwithstanding the dire results of heavy sledge work and of the gruesome winter, it is very remarkable how well the British sailor has stood the climate and the labour and the privations in all these Arctic voyages; showing, as the captain of the *Enterprise* observes, how wonderfully man is adapted to all climates, and also the importance of men being removed from temptation. This latter danger was well illustrated on the return of the *Enterprise* in 1854 to civilisation: on entering Hong Kong, November 1st, there was not a man on the sick list; before they left, on the 18th, there were nine.

*Food.*—In the account of the *United States Scientific Expedition* (1881–84) to the north of Smith's Sound, by the Commander Lieutenant Greely, U.S.A., there are some useful observations on food and clothing in Arctic travelling. His party of twenty-five persons (very well selected) lived two winters in Discovery Bay, in a hut, and preserved good health and excellent tone, while performing some hard sledging. He adopted the following scale of diet (partly on the advice of Professor Nordenskiold):—

*Daily Allowance, per Head, at Fort Conger*, 1881–4.

| | | |
|---|---|---|
| *Meats*:— | | |
| Fresh, *i.e.*, musk ox, hares, birds, &c. . . | 16·8 oz. | |
| Preserved: canned, pemmican, bacon, butter, milk, eggs, cheese . . . . . | 10·0 „ | |
| | | 26·8 oz. |
| *Vegetables*:— | | |
| Meal, biscuit, maccaroni, rice, peas, beans . | 13·6 oz. | |
| Canned vegetables: onions, potatoes, tomatoes, beets, carrots, &c. . . . . | 10·0 „ | |
| | | 23·6 „ |
| *Fruits*:— | | |
| Dried apples, peaches, grapes, cranberries, rhubarb, &c., preserves and pickles . | | 7·6 „ |
| *Sugar and Syrup* . . . . . | | 5·3 „ |
| *Coffee, Chocolate, Tea* . . . . . | about 4·0 oz. | |
| *Lime-juice* . . . . . | 1·0 „ | |
| | | 5·0 „ |
| | Altogether about | 70·0 oz. |

This scale is considerably in advance of anything adopted in the English expeditions, and appears quite calculated to keep up the strength of the party under any circumstances. But Lieutenant Greely (after his experience) recommends more vegetables and fruits, and some good cider, and a little wine and rum. His party were certainly free from scurvy, and indeed they only succumbed to actual starvation and exposure in the third winter.

*Clothing.*—Some notice of the kind of clothing usually worn in Arctic

travelling will be found in the note on "Sledge Travelling," and also on "Fitting Out"; but the following observations of Lieutenant Greely appear valuable, as they have not been so distinctly put forward by others, although no doubt felt by all.

He objects to skin garments, because they keep in the moisture, which, as everybody allows, is one of the chief troubles of ice travelling. For ordinary work, he recommends first-class woollen undergarments, and heavy woollen overclothes; and, for sledge work, double suits of the underclothing, and woollen overclothes with a fine smooth surface to throw off the snow and frost, which accumulates fast on any rough surface; with this latter object it is usual to wear fine canvas frocks and overalls outside of all. For the feet he recommends heavy close-knitted woollen socks with moccasins or Greenland boots, and fur inner soles to take the moisture of the foot. And for the hands, woollen mitts, with an outer pair of sealskin, and woollen gauntlets, without fingers, to cover the wrist. For the head a leather wool-lined cap, with ears.

For sleeping, he recommends double bags of fur or felt, that is to say, large enough for two persons, in preference to single, as it gives more room and warmth; and mattresses inflated with air.

AVERAGE MONTHLY SICK-LISTS, H.M.S. ENTERPRISE.

1852.—*Out of* 63 *Persons.*

Jan., 3·8; Feb., 3·3; Mar., 3·5; Apr., 7·1; May, 4·3; June, 3·2; July, 4·4; Aug., 4·6; Sept., 4·1; Oct., 5·3; Nov., 4·7; Dec., 3·5.

*Note.*—The number in April was due to snow-blindness, frost-bites, &c., in sledging.

1853.—*Out of* 60 *Persons.*

Jan., 5·2; Feb., 4·2; Mar., 2·7; Apr., 4·2; May, 5·6; June, 5·1; July, 3·9; Aug., 4·3; Sept., 3·7; Oct., 4·5; Nov., 1·7; Dec., 1·7.

1854.

Jan., 1·97; Feb., 3·71; Mar., 4·56; Apr., 5·77; May, 3·19; June, 2·8; July, 2·81; Aug., 1·07; Sept., 0·90; Oct., 0·48; Nov. 3·70.

In November, at Hong Kong, they took invalids on board.

*Average Sick-List.*

| | Nos. | Percentage. |
|---|---|---|
| July, 1851, to June, 1852 . . | 3·35 | 5·5 |
| „ 1852, „ 1853 . . | 3·62 | 6·0 |
| „ 1853, „ 1854 . . | 3·48 | 5·85 |
| Mean percentage, | | 5·78 |

## Note 28, p. 258: Personal Troubles in the Enterprise.

The present Editor has no desire to raise the ghost of departed troubles, but it is impossible to give a true idea of the difficulties connected with this voyage without some mention of the disputes between the officers, and of the questions between them and the captain. Such troubles were, unhappily, not unknown in other Arctic vessels at that time. There appears to be something in that particular service—either the intense cold, or the poor feeding, or the close confinement between decks for several months without regular employment, or in all these together—that stirs up the bile and promotes bitter feelings comparatively unknown under the ordinary conditions of sea service. It might be supposed to be some form of that insidious Arctic enemy, the scurvy, which is known to affect the mind as well as the body of its victims.

That warm-hearted man Captain Sir E. Parry says (on his second voyage in 1821): "The astonishing effects produced by the passions of the mind in inducing or removing scorbutic symptoms—those calculated to excite hope or impart pleasure to the mind have been found to aid in a surprising manner the cure of this extraordinary disease, and those of an opposite nature to aggravate its fatal malignity." It is therefore quite possible that the converse action may take place, namely, that incipient scurvy may produce a tone of mind to which everything seems "out of joint." But the medical officers agree that the officers of an Arctic ship do not suffer from scurvy so soon or so severely as the men; whereas the troubles arising from personal disputes occurred almost entirely among the officers. The men are generally described as most social and kindly disposed among themselves. Perhaps the care that is taken in selecting men for such service is not so strictly applied to officers. "Men for Arctic service," says Dr. Armstrong, "should be of a cheerful disposition, free from disease, 'without blemish, and without spot,' inured to the life of a sailor; strong and active, with capacious chest, sound heart and lungs, stout muscular limbs, with a light active gait"—a tolerably exacting list. But the Doctor considers that it was fairly fulfilled in the *Investigator's* crew, and therefore must have been *à fortiori* in the *Enterprise's*. In the case of officers, however, who have to show an example to the men, in courage, endurance, and spirit, the really important qualifications are not so much physical strength as a cheerful disposition and a kindly heart and self-denying spirit.

Of the superior officers of the *Enterprise*, only one combatant officer and the two surgeons had been in the Arctic seas before; they were therefore untried as to their capacity for standing that service. It is unnecessary, and it would be wrong, to enter now into any particulars of the troubles that arose on this head. The fault and complaints, when laid in cold blood

before officers in England in full health and spirit, doubtless seemed to them small, and sometimes even childish; but to the actors, as to children, they unfortunately appeared very real, and had a serious effect on the undertaking; and we must recollect that in all personal quarrels it is generally the manner, and not the matter, which gives the provocation. In all such cases the one officer in the ship on whose shoulders every such trouble really falls is the captain. He stands alone; he has the final adjudication of every case. He cannot escape from the responsibility, whatever occurs. It is he who is answerable for everything that goes on in the ship, for the duty to be done by every officer, for every movement of the vessel. Now, in the case of the *Enterprise*, it unfortunately happened that, by the end of the spring of 1853, at the end of the second winter—the second winter appears to be always the most trying one in the Arctic seas—there were some of the officers suspended from duty; and the one lieutenant who had served in the Arctic Regions before (and who, by all accounts, was a very amiable fellow) was killed before they entered the ice. Thus the captain was deprived of the assistance of some of his superior officers for the last two seasons, and a very great additional labour and responsibility was thereby thrown upon him. It can hardly be supposed that any man would deprive himself of this help under such circumstances except from a feeling of dire necessity. This very difficult and trying position of a captain in such cases is not probably fully considered by the officers when these troubles occur; and, in the case of the *Enterprise*, it does not appear to have been fully considered by the authorities in England at the final adjudication. The captain of the *Enterprise* was a man of most tender heart and generous disposition, but his strong sense of duty to the service gave him a decided and somewhat severe manner; and the reserve that always envelopes the commander of a war-ship is necessarily increased under such circumstances. In a private letter from Hong Kong, in 1854, expressing his sorrow at the condition of his officers, he says: "It has given me a warning that discipline is essential to comfort." No one, however, reading his Journal, written during the voyage, would suppose that any difficulty of the kind had occurred throughout it. There is never any hesitation about undertaking any course or exploration that appeared desirable towards the discovery of the lost ships. His chief idea, on finally coming out of the ice in 1854, was to fill up with provisions and fuel, and go back to look for his consort and complete the search.

On the return of the ship to England he was induced, by the pressure of high authority, to compromise the matter. But, in answer to some remarks in one of the newspapers at the time, he said, that if all the circumstances were known it would appear "that I only exercised the power entrusted to me when absolutely necessary." And in a private letter at the time he says he was drawn into the lamentable dissensions in an endeavour to settle amicably the disputes between the officers themselves.

The cold reception given to him by the Admiralty, and the absence of

any acknowledgment of the services performed by the ship under his command, coming after these troubles, and after the other disappointments of the expedition, had such a deep effect on him that he never would apply for another command in that service to which his whole life and thoughts had hitherto been given. By his contemporaries in the service, and by various public societies, his services in this expedition were well appreciated, and gained for him honours and position; but those three years of hard work, great responsibility, and of peculiar personal isolation, and of final disappointment, affected his naturally strong constitution, and materially helped to hasten his end.

"The law of a Polar expedition is obedience, and its basis is morality" (*i.e.* self-denial).—*Lieutenant Payer, Austrian Expedition.*

"By far the most important function of a Government in connection with Polar service is the selection of the commander of the expedition; a rare combination of qualities is essential, and fortunately there is a sufficiently wide scope of selection in the Navy. This point once decided, the choice of his officers should be vested by the Admiralty entirely in him; not necessarily his own followers, but no officer should be appointed without his entire concurrence. If there is any guile in a man, it becomes intensified in this service; for years, perhaps, there is no possibility of separation, no appeal, no safety valve. On return the commander is held responsible for failure, from whatever cause, and perhaps justly so; the credit of success, it is true, mainly falls on him also, and assuredly all possible means should be placed in his hands for attaining it. The bare fact of an officer having previously served in a Polar expedition should *in itself* constitute no claim for a further appointment on similar service. These remarks do not apply to the crew for obvious reasons; if the records of all Arctic service could be searched, it would be found that quarrels among them rarely added in any way to the anxieties or responsibilities of the leader, and that punishments of any kind among them were almost unknown, more than one expedition could be named in which they were entirely so."—*Note by Admiral Sir G. H. Richards.*

## Note 30, p. 268: POLAR ICE.

(*Chiefly from the Arctic Papers, R. Geographical Society*, 1875.)

By this term is generally signified the ice which is formed during successive seasons in the more open parts of the Arctic Ocean, this being different in thickness and in character from that formed in bays and channels every winter and dissolved every summer. The difference is so marked and so constant, that the converse proposition has come to be accepted by many Arctic voyagers, namely, that wherever Polar ice is found it is an evidence in itself of an extensive area of ocean.

The formation of new ice is described by Dr. Armstrong: First it appears as minute flocculi, which gradually become larger, and opaque, and globular; these by attraction coalesce, and form a thin oily-looking film over the water. All additions in thickness to this film are made from below, and, as the thickness increases, the pressure consolidates the particles into a denser block; but it seems to be agreed that the salt in sea-water does not freeze altogether with the water, but forms crystals separately. The salt crystals near the surface form a fine coating on the top of the ice, and gradually evaporate; but those in the body of thick ice remain in a sort of spongy state. The more rapidly that ice freezes, the more salt will be enclosed in it. Sir E. Belcher, in 1852, watched the operation of the freezing of water in glass cylinders; they were one foot long and one inch internal diameter, filled with clear water at 50°, and submitted to a temperature of —24°. Vapour (of a smoky lambent appearance) flowed off for a considerable time after the water was frozen and the ice had elongated itself out of the tube. During the process of freezing, the tube was placed in the focus of a strong reflecting lamp, which showed on a white ground behind the beautiful regularity of every motion. The crystallisation commenced from below, shooting its feather-like processes, signalising as it were (with its arms at 60° above or 120° below) to the surface; it in return replied by a similar signal, and interlaced its branches downward at the centre. This was succeeded by a milky infusion, similar to that of water introduced into a solution of camphor in alcohol, and all became chaos. Repeating these experiments with salt water, and at higher temperatures, as the point of general congelation approached, peculiar stars were produced and rose to the surface, where they became attached to, and formed the general mass.

Thus, we can understand that ice will vary much in character as well as in thickness. Young ice, containing all the salt crystals, does not afford good drinking water, but the upper parts of old ice, from which the crystals have evaporated, give pure water. Again, the lower part of thick ice, when exposed to a current of comparatively warm water, becomes

spongy, and the water penetrates further in, and softens the body of the ice while the surface remains hard.

*Increment of Ice.*—During the winter of 1853–4, Sir E. Belcher made observations of the gradual increment of ice, and gives the following table in his Journal:—

| Date. | Thickness (inches). | Temperature during interval. | | |
|---|---|---|---|---|
| | | Mean. | Maximum. | Minimum. |
| 1853. | | ° | ° | ° |
| November 5 . . | 18 | — | — | — |
| „ 25 . . | 28 | −25·7 | +2 | −37 |
| December 5 . . | 36 | −24·1 | −12 | −36 |
| „ 15 . . | 39·5 | −32 | −19 | −40 |
| „ 25 . . | 44 | −28·6 | −16 | −39 |
| 1854. | | | | |
| January 4 . . . | 54 | −17 | +26 | −46 |
| „ 14 . . . | 51 | −37·2 | −24 | −45 |
| „ 24 . . . | 54 | −44 | −27 | −54 |
| February 3 . . | 59 | −47·3 | −28 | −59 |
| „ 13 . . | 63 | −45·8 | −33 | −55 |
| „ 23 . . | 67 | −35·3 | −23 | −45 |
| March 5 . . . | 62 | −32·7 | −16 | −45·6 |
| „ 15 . . . | 65 | −34·6 | −19 | −49·6 |
| „ 25 . . . | 68 | −29·6 | −12·5 | −43 |

These three last observations appear to be distinct from the others.

This table is not quite satisfactory; in the original it is not always marked whether the temperature is + or −, it can only be inferred from the numbers; and no comment is made on the actual decrease in thickness January 4–14. But, judging by the table, the rate of increment does not appear to follow the temperature; the ice seems to increase rapidly up to about 4½ feet in thickness, after which the increment is tolerably uniform. But the ice does not reach its maximum thickness in March; in the *Enterprise* Journal, 1852–53, a thickness of 8 feet is recorded in May.

This rate of increment is confirmed by observations made on board the *Resolute*, Melville Island, 1853–54 (M'Dougall).

| Date. | Thickness (inches). | Date. | Thickness (inches). |
|---|---|---|---|
| 1853. | | 1854. | |
| September 10 . . | 3 | January 3 . . . | 54 |
| November 15 . . | 26 | „ 21 . . . | 62 |
| December 16 . . | 33 | February 2 . . | 66 |
| | | „ 15 . . | 74 |
| | | March 15 . . . | 84 |

(See also end of *Enterprise* Journal, p. 343, table 2.)

Lieutenant Payer (*Austro-Hungarian Expedition*, 1872) thinks the decrease of rate of increment as the ice gets thicker is due to the less conduction of the air temperature through it to the water below.

*Weight of Ice.*—Belcher also measured the weight of ice, in 1852–53, with the following results:—

| Date. | Thickness (inches). | Weight in lbs. of a cubic foot. | |
|---|---|---|---|
| 1852. | | | |
| October 26 . . . | 17 | 50 | |
| November 27 . . | 26 | 53 10 oz. | |
| 1853. | | | |
| January 1 . . . | 42 | 52 | Taken from the middle depth. |
| February 26 . . | — | 55 | " " " |

Which seems to show that as the ice gets thicker and older it becomes more dense. But the lower part appears to remain softer, for on April 9th, 1854, when the ice was 66 inches thick, he found the lower part of it rotten, "easily penetrated by a piece of wood;" and the lowest 2 inches, loosely cohering crystals; having, as Admiral Richards observes, the appearance of honeycombing.

Taking the specific gravity of sea water in the Arctic Sea, at the surface, as 1·026 (M'Clintock, in *Arctic Manual*), the above weights show a variation in the weight of ice from nearly 0·8 to 0·9 of that of sea water. This difference will account for the variety in the measurements in the proportions of ice above and below water made by Arctic voyagers. Sir E. Belcher considered that the usual law for the immersion of a level piece of ice was $\frac{8}{9}$ the whole thickness.

Lieutenant Payer (*Austro-Hungarian Expedition*, 1872) considers the specific gravity of sea ice to be 0·91, but that the proportion floating above water varies from $\frac{1}{10}$ to $\frac{1}{8}$.

Ice is also thickened by the deposit of snow on it, which gradually freezes into a solid coating. This of course gives good drinking water, and in the spring the melting of this snow coating, before the ice itself melts, forms pools on the surface, which much impede travelling, though they supply pure water. And this water soon eats its way into the body of the ice, and makes it soft and dangerous, although still thick and good in appearance.

Mr. Clements Markham (*Encyclop. Britannica, Ed.* 1887) seems to think that the ice in the Polar Sea is accumulating yearly, from the insufficiency of the outlets; and that the rolling hills of ice, 100 feet high, which have been found may be of great age.

Captain Nares (*Expedition* 1875) gives a list of thicknesses of ice, that is, flat ice unheaped by pressure, which have been measured by Arctic voyagers. The thickest is from his own observation in the North Greenland Sea, 100 feet; then M'Clure's off Mackenzie River, 80 feet; then Kane,

Smith's Sound, 60 feet; then Parry, Melville Island, 42 feet; then Scoresby, Spitzbergen Sea, 26 feet. This is understood to be ice that has remained undissolved and uncrushed for several years, and has therefore accumulated in thickness year by year, both by freezing of water below and of snow above.

Dr. Armstrong describes the massive floes met with off the north coast of Banks Island as of "a pearly blue," and of "flinty character," with a "rocky strength and hardness."

Ice has a certain amount of elasticity in it. Commander de Haven (*Grinnell Expedition*, 1852) observed a table of ice 18 feet by 15 feet and 4 feet thick, which had curved over a chasm in a floe, forming an arch. And another block 50 feet long and of rectangular section, resting on other blocks near its two ends, and bent down by its own weight so as to form the arc of a circle (*Arctic Manual*).

A floe is sometimes broken up by pressure from above. Sir E. Belcher records (March, 1853) that ice 7 feet thick was broken through by the weight of 15 feet of snow above it.

### *Hummocky Ice.*

The new ice of one winter is of course flat and smooth on the surface, but when it begins to break up in summer the pieces are carried against each other by the currents and winds, and, if there is any check, are piled on each other immediately in layers and hummocks of every shape and at every angle. The thickness of ice formed in one winter in the Arctic seas is from 5 to 7 feet. A little piling of such together will soon form a respectable mass. But that is only the beginning of Polar ice. Although a good deal of the ice, both old and new, is carried away by the currents in summer to warmer latitudes and re-dissolved there, much remains behind and is not melted, but is re-frozen together in the next winter and added on to. And this process may be carried on for several years in succession, every winter re-consolidating these masses and adding to them; every summer breaking them up and heaping them upon each other to form still greater masses, which, between the suns of summer and frosts of winter, soon take the form of rough hillocks of ice. And, when we consider the great thickness of the fields of level ice, we begin to realise the frightful force of great floes, sometimes square miles in area, crashing against each other. Captain Nares compares it to the closing of the two sides of a dry dock upon a ship. And we are no longer surprised to hear that the ice covering of the great Polar Ocean, instead of being, as from our own experience we might imagine, one illimitable level field, is, wherever explorers have penetrated into it, a succession of level spaces alternating with ridges of ice hills 20 to 50 feet, and sometimes 100 feet high, and of every conceivable irregularity of form. It is this hummocky condition which has stopped all sledge travellers attempting to penetrate across the ocean ice wherever they have tried it: Parry, from Spitzbergen; Wrangel, from Siberia; Nares, from the north of Smith's Sound; and Collinson, from the north-west coast of America—all had to give it up as

hopeless; the men were worn out with the severe labour and little result.

And these fields of thick and ridgy ice are not confined to the open ocean. The currents carry the floes when broken up in summer along the various channels through the Arctic islands, and, wherever there is an expansion of sea room, there they congregate, and lay perhaps for years. Thus they sweep through M'Clure's Straits, keeping that passage almost constantly choked, and fill Melville Sound, and are then carried on to the south-east into Victoria Straits, where they stopped Franklin's progress in 1847.

Dr. Armstrong describes the appearance of these massive floes very well, when the *Investigator* was coasting North America in August, 1850: "The formidable appearance of the ice was much heightened by the wonderfully refractive power of the atmosphere, which, added to the extreme fineness of the day, produced an aspect of grandeur and peculiar beauty. The large floe pieces, detached from the main body, presented a beautiful appearance from the spotless whiteness of their picturesque and singular surface. Such huge masses piled on each other could only have been effected by the most colossal force. On the more distant pack refraction had exercised all its distorting power, making it appear a lofty impenetrable wall of crystal, and its outline required but little effort of the imagination to trace out the forms of churches with towering spires, castellated mansions, reflecting from their icy sides tints of iridescent hue. . . . The evening was mild, and clear, and serene; there was a deathlike stillness and solitude, but associated with grandeur everywhere around. . . . The presence of our ship imparted a peculiar feature to the scene as she lay secured to a gigantic mass of that element which had lately so often endangered her safety. She appeared as if a captive in its icy grasp, as no trace of our entrance into this isolated pond, nor any way by which to effect an exit, was to be seen."

### *Floebergs.*

Captain Nares, when wintering on the north coast of Grinnell Land (1875–6), met with hummocks of such massiveness that he gave them the name of floebergs, to distinguish them from the regular iceberg. Lieutenant Greely, when he was subsequently in those parts (1881–3), observed these "bergs" in the channel between Grinnell Land and Greenland, and, from their rectangular form and height above water (100 feet sometimes), and the character of the ice, came to the conclusion that they were really icebergs proper. He gives a sectional sketch of one, which shows a stratification of ice and snow, the result, he thought, of the annual deposit of snow on land, forming an ice cap over it of immense thickness; similar, in fact, to the supposed formation of the vast ice walls found in the Antarctic seas, which are thought to be detached from an ice cap of 2000 or 3000 feet in thickness, covering a continent or archipelago about the South Pole. And Lieutenant Greely found foreign substances in the strata of these "bergs," stones and deposits of birds, such as would

be brought down by ice caps; and, to explain the salt found in them, he points out that the salt crystals exuded from salt-water ice are blown by the wind to considerable distances, so that snow inland is found to be salt. From all which Lieutenant Greely draws the conclusion that there is an ice-capped land at the North Pole from which these "floebergs" come.

Almost all voyagers in the American Arctic seas have, however, observed on the difference between the huge hummocky ice, or "Polar ice," and the "bergs" which come from glaciers; so that it is said there are no regular icebergs west of Baffin's Bay. And a distinct stratification has been often observed in ordinary salt-water ice, with foreign substances in it, the presence of which has been variously explained. It must also be remembered that in the lands on both sides of that long channel north of Smith's Sound there are many glaciers of enormous size, from which possibly such special bergs as observed by Lieutenant Greely might have been derived.

*Perils of the Pack.*

Every ship that sails the Arctic seas when and where these ice hills are in motion runs a daily, hourly peril of being crushed between the moving masses; and so many are the hairbreadth escapes recorded, that we cannot wonder Arctic voyagers feel more than other sailors the trust in the "sweet little cherub that sits up aloft to keep watch for the life of poor Jack." One of the most imminent of those narrated happened to the *Investigator* in September, 1851, while working round the north-west corner of Banks Land in the thread of a channel left between the moving pack and the rocky cliffs. At one time the passage was so narrow, with the ice cliffs on one side and the sandstone cliffs on the other, that the studding-sail booms, which project beyond the ordinary yards, had to be "topped up," to avoid striking on either hand. Soon after this the ship was made fast on the land side of a floe which had grounded in 12 fathoms water, and was therefore an island of a precarious sort. Other floes surrounded the ship, and she was lifted up and listed over, embedded in a cradle of ice; and for some days they were passive spectators of the attacks of ice monsters streaming by on their stranded friend, with shocks that made every timber quiver, and in a few minutes would pile a little mountain of ice upon their bows. A few feet difference in the direction, or a few minutes longer in the strain, and the hull would have cracked like a shell. Thanks to the solid strengthening done in the Naval Dockyards, Her Majesty's ships have generally survived this natural ramming. One shock from a mighty floe drove both ice cradle and ship from 12 fathoms depth into 8. What a grinding force on the bed of the sea! And on one of the rock cliffs near them the ice was piled up to a height of 90 feet. But the *Investigator* did not get free from her Arctic cradle until she made a violent struggle with 250 lbs. of gunpowder under 16 feet of ice, which gave a shock to cradle, ship, and all, sufficient to make cracks in a floe from 35 to 67 feet thick, and then, with some heaves, and shakes, and groans, she settled again into her native element in its normal condition.

Dr. Armstrong gives a clever sketch of the *Investigator* in her ice cradle, which tells better than words what Polar ice is like. In looking at it one is not surprised that on several occasions the crew had their bags on deck ready to escape to boats on the ice if the ship collapsed under the strain.

A still more imminent escape, because on a still more terrible coast 800 miles further north, and exposed apparently to the circumpolar sea, was that of the *Alert*, under Captain Sir G. Nares, in 1875–6. When lying behind a stranded floe on the open coast, she had to wait, in helpless contradiction to her name, the shocks and movements of the Polar ice during a whole winter. The ice-masters of the expedition, when they found her condition, were astonished at the massiveness and power of the ice, the like of which they had never seen, and declared that the ship would never get out of her ice berth; which, says Captain Nares, she would not, if the removal of the ice depended on its decay by the sun's warmth. But she did, by its being drifted with the prevalent current into warmer seas and there dissolved. The same expression of astonishment was drawn from the ice-masters of the *Enterprise* (accustomed to Baffin's Bay ice) on penetrating the pack north of Behring Straits in 1850.

"*No passage for ships this way*," is what is written large on every entrance to the open Polar sea. Such is the dictum of all voyagers who have attempted to get to the North Pole by way of the ocean clear of all land. Whether this region of "thick-ribbed ice," which seems to realise the poet's conception of extremest eternal hopelessness, is after all only a belt, beyond which lies an ever-flowing Polar ocean full of life, is still a question undecided. But at present the evidence as to the best way of crossing it, if it is to be crossed, is embodied in the pithy remark of one of the Arctic experts: "If you stick to the land, there you are, you know; but, if you get out into the open pack, why, where are you?"

## Note 31, p. 281: Breaking up and Resetting of Ice.

> "The ice was here, the ice was there,
> The ice was all around;
> It cracked and growled, it roared and howled,
> Like noises in a swound."—*Ancient Mariner.*

If the poet Coleridge had been an Arctic mariner, he could not have expressed more graphically the scene on the breaking up of the winter ice in August and the resetting of it in September every year. Indeed, from the middle of July to the beginning of October, that is, the whole period in each season during which a ship within the Arctic circle can expect to be under sail (and not often so long), there is an almost continual struggle with the moving floes. And no man can venture to predict from day to day when it will begin, or how far it will extend, or what will be the issue. In the evening the crew may retire to rest with a white field of solid ice around the ship as far as they can see; in the morning it will be one expanse of dark water. And a movement in the ice may be going on day and night for weeks together, and during all the time with a succession of the fearful noises imagined by the poet, and which have been described by those who have been kept awake by them, as the moanings of a dog—the cries of a wounded beast—the rasping of a titanic file—the rumblings of an earthquake—the blast of an explosion—or the roar of the thunder. All at once in the stillness of the night a startling crack is heard across the expanse; and then begins the grinding sensation, so dreaded by Arctic mariners, the sign of general movement among the floes; and which, if it reaches the ship, with the slow but irresistible force of great fields of ice many feet thick, may in a few minutes crush a large vessel between them. Then the ship begins to quiver and groan all over, and the crew stand on deck with provisions and clothes and boats, ready to take refuge even on the unstable surface of their enemy at the last moment; and this scene of hanging between life and death may go on for hours, and be repeated day after day. Whaling ships formerly got crushed every year in this manner, not being strengthened like the exploring vessels; as Belcher's Expedition came up Baffin's Bay in 1852 with the whaling fleet, two whalers got nipped; in one the ice was forced in from both sides and met inside the ship; the other sank in half an hour, the crew escaping on to the ice. The *Resolute* was raised 10 feet by the pressure of two floes. "Since the introduction of steam power into the whalers, there have been much fewer accidents of this kind" (R.).

*Formation of Hummocks.*—Extract from the Report of *Austro-Hungarian Expedition*, 1872–4, by Lieutenant Weyprecht:—

"With the exception of land ice, which clings to the coasts, and never reaches far out to sea, all ice—icebergs as well as fields—is in constant

motion winter and summer; and this, as has been shown, is through the influence of the winds. The motion, however, is a different one with almost every field, and thus a certain pressure results wherever two fields touch; this naturally leads to the breaking up of the fields, and the contraction of the ice during sudden low temperatures plays its part in a similar way. If one considers the great extent of the fields, sometimes of many miles, and their enormous masses, one can easily imagine the colossal forces which are active in these phenomena and the greatness of their effects. When two fields meet, either by direct contact or by a coach-wheeling process, a combat body to body ensues, often lasting only a few minutes, but sometimes even for days and weeks. The edges are then turned up on both sides, upwards and downwards, an irregular wall of ice, consisting of wildly mixed blocks, begins to build itself, the pressure increases more and more, masses of ice 8 feet long and broad are lifted 30 to 40 feet high, and then fall to make room for others. At last one of the fields begins to shift itself for some distance underneath the other one; often they separate for a while, only to renew the struggle. But the end of it always is, that the intense cold unites all in one solid mass; a single field results from the two; and then the next storm or quick change of temperature cracks the new field in some other direction, and the pieces renew the old struggle.

"During winter snow-drifts fill up smaller irregularities completely. As soon as the sun begins its action the crushing of the ice decreases, the winterly ice walls diminish considerably, immense masses of ice and snow are melted, and the resulting sweet water forms large lakes on the field. During the summer about 4 feet of ice are thus melted down from above; in the following winter it grows below, and thus the whole of the ice is in an uninterrupted process of renovation from below upwards; we may conclude that all the old pack ice is replaced by new in the course of two years.

"Within twenty-four hours, and with a temperature of $-37{\cdot}5°$ to $-50°$ C., the new crust (of entirely fresh ice) becomes about a foot thick. A considerable quantity of salt freezes into the upper strata of the ice (when quickly frozen). The upper strata, on account of the salt they contain, attract moisture, and form a tough leathery mass which bends under the foot without breaking. After a time the salt crystallises out of the ice, and forms a layer over it, sometimes 2 inches thick." (*Arctic Manual.*)

### *Dock Cutting.*

When it is evident that no progress can be made, the next best thing to do is to get into as safe a position as possible. And one of the modes of effecting this, practised frequently by Arctic voyagers, is to cut a dock for the ship in a large or fixed floe of ice; so that, when the pressure comes, it will be expended on the ice and not on the ship. This dock cutting can only be effected in comparatively thin ice, that is, thin for Arctic climes, namely 3 or 4 feet. Mr. M'Dougall describes the process:—

"The outline of the dock is marked out on the ice rather larger than the vessel, and is cut through with ice saws. These are large and heavy steel saws (10 to 17 feet long, ¼ to ½ inch thick, and 9 inches wide), and worked by a party of six or eight men, with a rope passing through a pulley suspended to a triangle, and which admits of 3 or 4 yards being cut without moving it. (In 3 feet ice, 10 feet can be cut in 3 minutes.—Belcher.) A diagonal line across the dock is also cut. If the ice cannot be moved after being so cut, small charges of powder (2 to 4 lbs.) in old preserved meat tins, protected from the water, and fired with Bickford's fuze, are lowered through holes to a few feet below the ice. The simultaneous explosion of several of these charges breaks up the larger pieces." (See Note on "Use of Gunpowder.")

"With several parties at work, a dock in ordinary ice can be cut and cleared in less than an hour. It is so common a practice, that when the word "dock ship" is given the several parties are quickly marshalled with their implements, and make a lively and inspiriting work of it. In 1852 a dock was cut for the *Resolute* in 4 feet ice, 130 feet long, average 40 feet wide (with diagonal cut) in 50 minutes; and the ship secured in it 20 minutes more." (M'Dougall.)

And in July, 1853, a canal was cut for the *Assistance* 600 feet long and 60 feet wide, in ice apparently 2 to 7 feet thick, by sixty-four men in twelve hours; but the ice was becoming rotten at that time of year.

Every season, either in getting the ship into a safe nook, or in getting her out of it again, some cutting and blasting has to be done.

Perhaps the longest canal in the ice ever cut by Arctic navigators was made by the earliest of these modern explorers, Captain Parry, in 1823; in order to get his ship out of winter quarters at Igloolik Island, he cut a channel for her, in ice from 12 inches to several feet in thickness, and for a distance of 4340 feet. There is a sketch of the ship passing through this channel in possession of General Sherer, late of Bengal Army.

### *Sailing in Ice.*

When the ship is under way, the anxiety and the labour still continue. She has to thread her way along lanes of water through the moving floes, with sometimes barely room to tack, receiving or avoiding shocks on either hand; sometimes from lack of wind, or fog, making fast to a substantial moving floe (as a protector or guide); or anchoring to a stranded floe on its shore side (as a fender); and watching, from that comparatively safe position, the moving masses come slowly up and delivering their charge against the fixed mass, with a shock felt through the vessel, and then crushing along its edge, and often rearing up a little mountain of ice close to her sides. "So fettered does the aspect of affairs become in a short time from slight causes in ice navigation at this season, that the delay of a few minutes may cause a ship to be immovably fixed; or, on the other hand, a change in wind or direction of current may in equally short time cause as great an alteration in the pack—loose streams of ice detached—channels of water formed" (Arm-

strong). All of which places a special strain on the commander, on whose instant decision may depend not only the success of the expedition, but the existence of the ship.

*The Beginning of Movement: Currents of Warmer Water.*—The cause of the sudden breaking up of ice in the autumn and of its very uncertain action is not yet clearly explained. It is apparently not due to the direct action of the sun on the ice, for, although that might dissolve or break up the ice of one year, it is not powerful enough, or lasting enough, to produce great effect on the accumulated thickness of several winters; and, if it was, there would be no old ice in the Arctic seas. It seems to be the effect of comparatively warm currents in the summer, continually disintegrating the under portions of the ice. These warmer streams, which, whatever their cause, are continually flowing from the equator in the direction of the poles, and apparently more especially in the direction of the North Pole, are naturally warmer when the sun is on the side of the equator towards that particular pole, and will, in the course of their progress north, lose less of their warmth at that time than during the winter months. That this is so is evidenced by the temperature of the water in the spring, under the ice, being often higher than that of the air; which fact is also indicated by the prevalence of fogs over the Arctic seas at the same season. And the observations of Belcher and others, on the rotten character of the under ice in the summer, seems to point to the same action of the warmer currents: "the appearance of the under surface of the floe in July and August very much resembles a honeycomb" (R.).

The direct action of the sun, though it has an immediate effect on the snow covering the ice, does not so easily disintegrate the thick ice, well solidified through an Arctic winter. This appears to be due to the conductive quality of the older ice, and which probably increases with its density. In sledge travelling, the snow is always found warmer than the ice, and stones or earth warmer than the snow. Captain Nares observed that the heat of the sun passed through a layer of ice and affected wood underneath it. And in June, 1854, Captain Belcher observed that the sun melted the frozen mud, without having any apparent effect on the ice.

*Tidal Action.*—Coupled with this continuous action of the warm currents of water is the alternating action of the tides, which has a distinct observable effect all over the known Arctic seas. Under its influence the ice rises and falls every day, and the pressure is sometimes very great. In 1853, in Northumberland Sound, on a hole being made in 6 feet ice, for a tide pole, the water came up and covered the surface of the ice for a depth of 10 inches; and, as this oscillating motion takes place from the beginning of the formation of the ice, cracks are necessarily made in it, and keep opening and closing during even the coldest parts of the winter. There are also cracks in the more massive older ice, where the loose floes have been joined together again after the summer, and which are therefore more easily opened again by the tidal pressure.

*Sudden Changes.*

Thus during the whole winter there is a continual pressure under the ice, tending to break it; and, as soon as the ice becomes well disintegrated by the warm currents, this pressure breaks it up altogether. An unusually high tide, coupled, as it often is, with an unusually high wind, thoroughly completes the process, and moves a great expanse of ice in detached masses; which, however, by another change of wind, and a colder temperature, may in a few days, or even hours, become re-consolidated into one great field again.

This breaking up and resetting causes much trouble and anxiety in the early summer. The way to the land is impeded by pools of water on the ice from the melting snow, and by cracks too broad to be bridged over. These are particularly liable to be made between the ship and the shore, because the ice in shore is generally grounded towards the end of the season, and therefore does not move much with the tide, and consequently a permanent crack, running more or less parallel to the shore, is always formed at the point where the floating ice joins the grounded ice. In the first winter (at Northumberland Sound) Sir E. Belcher was caught in this way on a short excursion, on his sledges. The ice was not settled for the winter, and broke up, leaving him on an island without a boat; he had to extemporise one out of the materials at hand. "This ice was totally unfit to travel on; we got to the island, after the sledges frequently breaking through; and half an hour after the field we had travelled on was an open sea" (R.).

In August, 1853, the *Assistance* and *Pioneer*, lying in Baring Bay, Wellington Channel, there being no appearance of water in the morning, by the evening had been carried out to seawards, ice pack and all, in a furious gale; and for the next two months were drifted up and down the channel amongst the ice floes by the wind and tide. (The *Assistance*, with her holds cleared for winter and boats stowed overhead, was thrown on her beam ends, and lay so for some hours.) In the same month of the same year the *Enterprise* at Cambridge Bay experienced a similar sudden change; but happily for her in the converse direction (Journal, p. 292).

Sometimes it is neither ice nor water, but a sort of sludge with a thin crystal varnish over it, impassable by ship, boat or sledge; and when this happens in the cracks numerous immersions result. Half an inch of ice, if of considerable extent, will check a sailing ship, unless with strong free wind (Parry).

*Halkett's Boats.*—At these times Halkett's india-rubber boats were found to be of great value; light and flexible, they were easily carried across the firm ice, and were sufficient to convey the party across the open cracks. There is scarcely a record of any of the voyages at that time which does not mention Halkett's boats with gratitude, for services like the above, as in some cases it was a question of life. They were 46 lbs. weight, and held four persons.

*Currents.*—The remarkable voyage of the *Tegethoff (Austro-Hungarian*

*Expedition*, 1872–4, by Lieutenant Payer) in the north-eastern seas, above Nova Zembla, gives evidence of the effect of currents in those seas. Partly owing to the current sweeping past the North Cape, she made the land about the centre of Nova Zembla, and coasted up to Cape Nassau; beyond which, in September, she was beset in the ice, and carried with it, by wind and stream, in a north-east direction, for some 200 miles; and then was caught with a new current and a different wind, which drifted the pack and the ship to the westward again, for a greater distance, to Franz Josef Land. For nearly fourteen months the vessel was thus carried on the ice, cradled in a floe, 10 to 14 feet above the general level of the surface, never afloat during the summer; and for 130 days during the winter the movement of the ice never ceased. Lieutenant Payer considers that the effect of the Gulf Stream penetrates at least to Nova Zembla. His observations showed that the ice melted from above, not from below: there was a distinct vertical decrease in the thickness, of 6 feet from above, during the summer (lat. 79 near Franz Josef Land).

This isolated vessel, of 220 tons and seventeen men, endured two winters in the ice in that high latitude, deprived of the sun for 125 days each winter; and finally had to be abandoned, the crew making their way back to Nova Zembla in boats.

## Note 32, p. 283: Eskimos.

*Origin.*

The natives now inhabiting the Arctic coasts of America are commonly called by us *Esquimaux*; but this is not a name known to the people themselves; it comes to us from the North American Indian word *Esquimantsic*, signifying "eaters of raw flesh," which is true of this people, being in fact a necessity of existence in that climate. That form of spelling arose from our getting the name from the French. Ethnographers now write it *Eskimo*.

The term *Huski*, so generally used by Captain Collinson for these people, is simply the sailors' abbreviation for *Eskimo*.

Where they originally come from, and to which great family of the human race they belong, seems to be still undetermined. Some ethnographers have thought them to be a branch of the American Indians, from the similarity of structure of the language. But Mr. C. R. Markham, who has collected much information about them (*Arctic Papers, Royal Geographical Society*, 1875) gives good evidence that some of them at least migrated a long time ago from the Siberian coast, and are kindred to some of the tribes now living on that coast. Professor Nordenskiold, the well-known Swedish Arctic traveller, who has more lately been on both the Siberian and American coasts (Voyage of *Vega*, 1878–9), thinks that America is the original, or at least the earliest known home of the *Eskimos*, because the tribes now living on the Asiatic side of the same race are few in number. But the story he himself gives of what is known about their ancient inhabitation of the Siberian coast, together with Baron Wrangel's account of the legend of their emigration from it to the American side, seems rather to lead to the conclusion that they were the prior occupants of Arctic Asia before the present races appeared on the scene.

The appearance, and manners, and habits of the American *Eskimos*, as described by all travellers from Captain Parry to the present day, are more Asiatic than American. Sir J. Richardson (*Polar Regions*, 1861) says they have "broad egg-shaped faces, prominent but rounded cheeks, tapering foreheads, broad depressed noses, small oblique eyes, complexion nearly white, broad shoulders, short legs, small hands and feet." They are also described as a domestic, gregarious people, with strong family affections, mild and cheerful; intelligent and especially ingenious in handiwork of all kinds, including drawing, for which last accomplishment they appear to have a remarkable talent.

Now these characteristics are very much the same as those of the Chuckches, or Tschuskis, or Tukotschis (as they are called by different travellers), now inhabiting the north-east coasts of Siberia, as described

by Professor Nordenskiold; and whom he considers to be the people who drove out the original *Eskimo* tribes from that coast. There are, however, some families of undoubted *Eskimo* origin still inhabiting the Asiatic coast of Behring Strait. And Sir J. Richardson quotes Frobisher and other early travellers, remarking on similarities between the Samoyeds (who occupy the coast opposite Nova Zembla) and the *Eskimos*.

The general opinion of ethnographers appears to be that the *Eskimos* are a branch of the great Mongolian family; which is a tolerably safe admission for the present, as the whole of the North American Indians are supposed to be derived from that stock. Indeed, Professor Nordenskiold remarks on the similarity in appearance between many of the Chuckches and the American Indians. And that the *Eskimos* are the remains of an earlier wave of migration from Central Asia; and that some centuries back they were a large population spread over a considerable part of the coasts of North Asia and North America.

### *The American Eskimos.*

The traditions of the American *Eskimos* themselves, and the remains found in various parts of that Arctic coast, point to a steady migration from west to east. And it is reasonable to suppose that this proceeded along the easiest line; that is to say, across the neighbourhood of Behring Strait, and along the north coast of America, where they would find the most secure passage for their canoes. Accordingly we find that all *Eskimo* tribes from Behring Strait to Labrador, though differing in dialect, in character, and in power, are considered to be of the same stock, of successive waves of migration; the more eastern, and therefore older emigrants, being more variated from the original. When this migration began there is no clear evidence to show; but as they were found on the coasts of Labrador by the first European explorers in the fifteenth century, as regularly settled as they are now, it must have occurred considerably before that period. Sir J. Richardson considers there is some evidence that the *Eskimos* in former times extended down the west coast of America as far as Vancouver Island, and down the east coast as far as the River St. Lawrence.

This general idea accounts, so far, for the existence of the *Eskimo* on the north coast of America, and gives a key to their ways of life, and to their general condition. They are a people who live by what may be called coast fishing; very different from the habits of the nomadic hunters in the interior of North America, as they are in appearance and manners. They are, however, so far nomadic, that they move in winter to huts in sheltered spots on the rivers near the coast, where they have a chance of getting game of some kind; in the spring they begin fishing on the coast, and those who are opposite to Victoria and Wollaston Lands cross over the narrow channels on the ice, and spend the summer in fishing and hunting on those lands; for the land animals also cross over from the Continent, about the same time, to feed on the young plants, which are more luxuriant there. The natives met by the *Enterprise* in the southern

parts of Wollaston and Victoria Lands appear to have been fair specimens of the American tribes. The remarks on them will be found in the Journal, in August, 1852, August, 1853, and July, 1854.

These tribes, during the summer, live in tents supported on such pieces of wood as they find on the coast, and covered with skins; it is remarkable that they have no canoes, which shows that they do not penetrate far into the interior of the Continent, or they would have reached the northern limit of forest trees. The *Enterprise* found no traces of their wanderings further north than lat. 72°, and no recent traces of them have been found in Banks Land or north of Melville Sound; but more to the eastward they penetrate nearly to Lancaster Sound. To the westward, towards Behring Strait, the *Eskimos*, having been in greater communication with white people, are not so simple in habits nor so well behaved. The habits of these people, as must be expected in a community whose main business is to keep up the heat of their bodies, are extremely disagreeable, to say the least of it, to civilised persons; and, probably from the same intense struggle for existence in that climate, the moral senses as regards truth and honesty are somewhat deficient. But all travellers, not only among the *Eskimos*, but in Siberia among the Chuckches, bear testimony to their good humour and genial ways, in which they resemble their Mongolian kinsmen, the Chinese and Japanese; all agree also they are unable to resist the temptation of appropriating other people's property at favourable opportunities. A further evidence of their non-American extraction is afforded by the bitter enmity between the two peoples; a state of feeling unfortunate for white travellers in those regions, because it produces a chronic state of fear of strangers of all kinds on both sides. At all events, this feeling of suspicion, combined with the absence of moral control, requires all travellers to be cautious in their dealings with the *Eskimos*.

One of the remarkable characteristics of these people is their commercial zeal. There is, and has been from the first knowledge of them, a regular system of communication for trade all along the line of their occupation. The objects of barter are passed on from tribe to tribe along the coast from Behring Strait to Labrador, until the products of the latter country are exchanged with those of Russia. An ingenious and successful mode of disseminating news during the great search for Sir J. Franklin's expedition was carried out by H.M.S. *Plover*, from Behring Strait, in the form of BRASS BUTTONS stamped with short notices, which, being coveted by the natives, converted them into involuntary postmen. By this means the *Enterprise* first heard news of the *Investigator* and of the Eastern Expeditions, which news had gone from Melville Sound to England in letter, by ship, and had returned, per electric telegraph, to the United States; and from San Francisco to Behring Strait by letter and ship again; and from thence it had travelled eastward once more on buttons, the various vessels concerned having been at the time within 300 or 400 miles of each other—one of the most curious instances of postal circumvolution.

*The Greenland Eskimos.*

This branch of the *Eskimo* people has not been included in the foregoing account, because they have a peculiar and interesting history of their own. Their own traditions are that, although they came from the west, it was not by the route of the North American coast and Labrador, but from the north. There is not now, nor apparently ever has been, any communication between the Labrador and the Greenland *Eskimos;* the breadth and dangerous ice of Baffin Bay appear to have stopped the flow of migration from the westward.

There is some evidence to support this tradition of an independent migration "north about." In the middle of the fourteenth century, when the Scandinavians had already occupied the west coast of Greenland, the *Eskimos* appeared suddenly, coming down the coast from the north. They were the ancestors of the people now occupying Greenland, and some of them are still inhabiting the coast as far north as Smith Sound. They are somewhat different from any of the American *Eskimos*, though undoubtedly of the same race. Their speech differs from that of any of the American branches more than it does among those branches themselves, and is more approaching to that of the Asiatic *Eskimo.* And although they recognise the same name by which all the other branches call themselves, namely, *Innuit*, or *En-yu-in*, signifying men of the race, the Greenlanders also call themselves *Kalalik*, a word which seems to have some connection with the Siberian tribes. They are larger, stronger, and braver than the American tribes, and their habits are different. Though they fish and hunt, and have abundance of reindeer, they do not use bows or arrows, nor canoes so much as some of the others, but sledges much more, and dogs to draw them. Then there have been found on the extreme northern lands of Greenland and the islands to the west many remains of their former occupation, and also on the north-east coast of Greenland, a position they could have hardly reached from the south. These remains are judged to be very ancient, and there are no traces in any of those parts of occupation by any *Eskimos* of the present time.

And, lastly, there are traditions among the Chuckches, now inhabiting the north-east corner of Siberia, that a whole tribe of former inhabitants of those parts, called *Onkilon*, or dwellers on the coast, and of another tribe called *Omoki*, to escape the invasion of the Chuckches, went away bodily in their canoes across the sea to the north-east. And the tribes about Point Barrow have a tradition that some of their ancestors went north from that part, and found these people living on islands in good condition.

*Their houses.*—But the most remarkable, and to ethnologists perhaps the most interesting, incident about these Greenland *Eskimos* is their houses; that is to say, of those of North Greenland, for the natives now living about the Danish settlements in South-west Greenland have become a more civilised people. These houses are circular or oval in plan, and built of rough stones, converging inwards by overlapping courses until they nearly meet

overhead, and there the opening is covered by large flat stones. They are partly sunk in the ground, and the exterior is covered with sods or earth. The interior size is 8 to 12 feet across, and 5 or 6 feet high. This must not be confounded with a regularly arched dome, though curved in form, the successive courses of stone being horizontal. The remains of similar stone houses have been found in many places on the islands to the west of Smith Sound; a great many in Grinnell Land, especially on the west coast; at the north end of Wellington Channel and of Jones Sound; on Melville Island, and other islands north of Melville Sound; and on the west coast of Banks Island. Between the latter place and the coast of Siberia there has been, as yet, but little exploration of the sea; but on the Eastern Siberian coast remains are to be found of stone huts corresponding in general to the above character; and especially in one peculiarity, the entrance, which generally consists of a narrow passage cut through the ground, and covered over with stones and earth, either for warmth or defence.

And also on the islands of New Siberia, remains of what are called "ancient Yourtes" have been found, of a similar idea, although constructed of logs and planks of wood, roughly shaped with rude implements. But the date of these is not determined. The remains of the *Omoki* tribe, found near the Kolyma River, appear to have been of a similar construction to these.

This kind of construction, of a solid, permanent character, and well covered in, appears to be peculiar to the people we call *Eskimos*. The western tribes of these people, living about Point Barrow, construct wooden huts for the winter, similar in form and idea, and covered over with earth or moss, and having an underground passage, low enough to enter below the floor of the hut. With them wood is plentiful and stones scarce. Again, the Eastern American *Eskimos* build huts of frozen snow-blocks, circular in plan, and domical in form. These are so well constructed, and have such a perfect and elegant appearance, that they have excited the admiration of all Arctic travellers. They are not, however, regular arched domes, as some have supposed, but the courses of snow blocks are all horizontal, converging inwards till near the top, where the small opening is covered with a slab of ice, the interior surface being smoothed off to a regular curve; identical, in fact, in point of construction, with the stone *Iglus* of the northern Greenlanders. The Chuckches of Siberia, who now occupy the coast of the ancient *Onkilon* and *Omoki* people, use no such houses. They live in tents, summer and winter, but the winter tents are of a large size, and are carefully made with upright poles and rafters, converging to the centre, and covered with skins; and they use the old dwellings of the former people as storehouses. It is, however, curious that the Lapps living on the northern coasts of Russian Lapland live in huts of conical form, made of wood stakes covered over with mud; and that, in a sketch from a voyage made in 1594 of a Lapp settlement in those parts (in Nordenskiold's *Voyage of the Vega*), their huts are shown exactly like the *Eskimo* snow huts of the present day.

These circular or oval houses, built with converging courses of stone, and having entrances like little tunnels, are found in various parts of the world. In the Shetland and Orkney Islands there are some good examples of them. That fact, however, does not altogether prove the builders to be all of one race; for if we have given a land of stones without wood, and no good implements to cut the stones, the simplest and easiest form of getting shelter would be a hut of that form and construction.

The above notices of the Eskimo people have been obtained from the *Arctic Papers*, published by the Royal Geographical Society in 1875; from Sir J. Richardson's *Polar Regions*, 1861; from Professor Nordenskiold, 1881; and Lieutenant Greely, U.S.A., 1885, and from the account by Dr. Simpson, H.M.S. *Plover*, in the *Arctic Papers*.

## Note 33, p. 290: Animal and Vegetable Life.

(*Taken chiefly from the Arctic Manual.*)

The places and times at which animals are to be found in considerable quantity in the Arctic seas are matters of great importance to the Arctic voyager, as well as of interest to the scientific investigator. And the movements of animals are connected with the vegetation appearing in different parts of these regions during the short-lived Arctic summer; for where the food is to be found there will the animals go. And this vegetable life is again interwoven with geological formations, and also with the climates of the various parts, each giving some indication of the existence of the others.

In those parts of the Arctic regions north of America, there is one fairly general distinction that may be drawn in this respect: the climate on the western parts is milder than to the eastward; and therefore both vegetable and animal life flourish better and extend farther northwards on the western side, wherever the geological conditions are favourable to it. Thus, reindeer, musk oxen, hares, and wolves, besides land and water birds, were found in fair quantity on Banks Island and the west coast of Prince Albert Land, on Melville Island, and Prince Patrick Island; whereas, on Prince of Wales Land, North Somerset, North Devon, and Wellington Channel there were comparatively few of any kind, scarcely any musk oxen. An exception must be made with respect to the channel N. of Smith Sound, on the west side of which, owing to geological conditions, musk oxen and reindeer were found up to the farthest northern land, though few in number.

These variations appear to be due to special soil and climate, and to the subject of migration. The chief part of these Arctic islands belong to the geological formations of the Silurian, Devonian, and Carboniferous rocks, which are generally favourable to vegetation. Almost the whole of Greenland belongs to the primary formation of granite and schistose rocks, which are generally unfavourable to vegetation. Here again an exception must be made of the south-west coast of Greenland, which has a milder climate, due to the warm current coming along it from the Atlantic, and also to some patches of more recent geological strata. Along this coast of Greenland there is a good deal of vegetation and a plentiful animal life; whereas on the west side of Baffin Bay there is an absence of vegetable life and of land animals; this latter failure of vegetation is owing to the character of the soil. The schistose beds and the highly laminated limestones of the Silurian strata are particularly barren of vegetation, and they extend from the mainland of America, through King William Land, Boothia, Prince of Wales Land, and North Somerset. (Richardson, *Polar Regions.*)

The climate and the vegetable life are also modified by the currents of

warm water coming from the Atlantic and Pacific Oceans; these currents, entering the Arctic seas by Behring Strait, and the Greenland Sea, have a tendency (arising from the rotation of the earth) to move in an easterly direction; and they produce a higher temperature and a moister atmosphere along their course, favourable to vegetation. Hence the westerly sides of islands and promontories are generally warmer than the east sides, the warm currents being deflected along them.

*Migration.*—Along the north coast of America, from Cape Bathurst eastwards, all the Arctic animals (except the musk ox) appear to migrate northwards across the narrow channel on to Prince Albert and Victoria Lands, and from them to Banks Island. The *Enterprise* observed deer crossing from the mainland in April, 1853, and again in August of the same year assembling in hundreds to recross back again over Dease Strait. And the *Enterprise* and *Investigator* observed deer crossing Prince of Wales Strait both ways; but it was the opinion of the officers of the latter ship that the main part of the animals, including musk oxen, on Banks Island, wintered there.

There is no evidence of the crossing of animals (except bears) over that continuous channel extending from M'Clure Strait on the west to Lancaster Sound on the east, and consequently it is believed that all the animals found in Melville Island, Prince Patrick Island, and others adjacent, winter there; this includes reindeer and musk oxen in considerable numbers.

All the Arctic animals, including deer and musk oxen, are found on the west coast of Greenland as far as Smith Sound, and also on the land west of that sound; and, although deer have been observed crossing that channel, it is believed that the main body of the animals winter in that extreme north-west land. It is also known that they winter on the west coast of Greenland.

### *Animal Life.*

*The White Bear*—king of beasts in the Arctic Circle—is found everywhere on sea and land, winter and summer, wherever there are land animals, seals or fish to feed on. He is a valuable prize to the Arctic traveller, for his flesh, his fat, and his skin; but he is also the one dangerous foe, for he is strong and fleet of foot, and takes a good deal of killing. His weight is much reduced at the end of the long winter, so that until towards the autumn he is not of much value as food or fuel. Captain Richards notes, on one of his sledge journeys in June, that a bear was not worth following, "he had not a day's fuel about him."

Mr. M'Dougall (*Resolute*) gives the average weights of some of the animals useful as food in the Arctic regions; these weights appear to signify the weight of useful meat obtained from them.

*Musk Ox:* weight in summer, 340 lbs.; average through the year, 160 lbs. This animal, though small in size, shows an amazing amount of courage, and of intense passion when attacked. Its flesh is very palatable in general, but sometimes, especially when kept too long, it has the taste of musk, which gives it its name, and which is very disagreeable.

*Reindeer:* average weight 60 to 70 lbs. This animal is the most valuable one (next to the seal) in the Arctic regions. Its flesh is excellent, as good as any other venison (to an Arctic traveller). Its skin is the best for clothing, as from its close texture and pliancy it keeps out the cold better than any other. Its bones and horns are most useful for weapons and framework of sledges and canoes.

*Hares:* weight 8 lbs. These are to be found almost all over the Arctic lands, and in some parts are very numerous. *Wolves* and *Foxes* are similarly found, though not so plentiful.

*Geese and Ducks:* weight 2½ lbs. These are found everywhere in the summer, as they move north or south according to the season, and sometimes in large flocks.

*Ptarmigan:* weight 1 lb. This is *the* game bird of the Arctic regions; found everywhere, and for the most part plentifully.

*The Lemming.* This is the most universal and the smallest of Arctic animals. Though not much bigger than a mouse, it is found everywhere, even in the extreme north of Smith Sound. It lives under the snow in winter, feeding on the few plants, such as saxifrage, which preserve their existence under that covering. It is the food of many other animals and birds, as well as of man.

Osborn (*North-west Passage*) gives a lively description of the habits of the white bear, and of some other animals of those regions.

*Of sea animals, Whales* were found in considerable numbers along the north coast of America, and were seen in M'Clure Strait north of Banks Island, and are plentiful in Baffin Bay; but they do not appear to go further north. Sir E. Belcher indeed found the bones of whales up in the north-west part of Jones Sound, but, as it was on land several hundred feet high, it must belong to some former geological period. Some parts of the flesh are palatable to white tastes, when nothing better is at hand.

*Seals* are found all over the Arctic seas, and form the chief source of food and fuel to the *Eskimos*. *Walrus* are also found almost everywhere. Both walrus and seal are eatable by white men, under the above noted circumstances.

*Fish* of various kinds are to be found in the Arctic seas; but either they are not plentiful, or the British sailor is not an expert fisherman, for they do not appear to have been a dependable source of food in the expeditions generally. The *Enterprise* was exceptionally fortunate in getting a large supply of salmon in the lakes and rivers along the channel on the north coast of America.

As you go north in the Arctic seas, the animals, whether of land, sea or air, become fewer, that is to say, the species become fewer, though the individuals may remain numerous. At the north parts of Prince Patrick Island and the neighbouring islands (about lat. 78°) scarcely an animal of any kind was to be seen, not even the "white king of the white sea." Nevertheless, far as men have gone northward, they have still found flocks of birds flying from still farther north on the approach of winter;

which implies some amount of open water containing fish in that yet unexplored region.

On the whole, although game of all kinds is always spoken of as a most valuable relief and alterative food, yet the general opinion of the voyagers of those days seems to be, that even in the most favoured spots, such as Melville Island, *game cannot be depended on as a sure supply of food to an exploring party in Arctic lands.* No doubt, in almost all the cases at that time, there were two great difficulties in the way. The huntsmen had little or no skill in the craft, and time was too precious to expend on so precarious an attempt. But at Melville Island in 1853–54, Captain Kellett formed a regular hunting organisation; within a range of 15 miles there were five hunting parties, and game of various kinds was plentiful; and they obtained enough to supply from 1 to 1½ lbs. per man of the crew, per day, for a considerable time. And yet he said that a party of Europeans could not expect to support life there by hunting.

### *Vegetable Life.*

The flora of the Arctic lands is described by botanists as belonging partly to that of North America, and partly to that of North Europe and Asia; the general (though not precise) dividing lines being Baffin Bay and Behring Strait. The diffusion and admixture of these different flora is considered to have been caused by varying temperatures in the North Polar region at different geological epochs. At one period a temperate and even a tropical climate extended as far north as exploration has yet gone; this apparently was followed by a period of extreme cold, greater than that of the present time, during which all vegetable life seems to have been driven south. Then followed a return to the comparative warmth of the present age, in which the flora has gradually crept north again, though of a somewhat different character, towards the Pole. But as vegetation proceeds into colder regions it becomes more stunted, and the less hardy plants gradually cease to appear, until a few only remain, which are, in their reduced state, capable of defying the greatest cold of this present epoch as long as they can find some nourishment.

At the present period the limit of tree growth appears to be lat. 68° on the American side (Richardson), and about the same on the Asiatic side; that is, not quite up to the northern coast-line in either hemisphere.

But the smaller plants extend as far north as exploration has gone as yet. Among these some varieties of saxifrage are the most universally spread and the most hardy. Captain Nares found it at the north end of Smith Sound in lat. 82°, putting forth its new shoots almost before the snow uncovered it, and in some cases living though exposed without that cover to the winter temperature. It is from these plants and the mosses and coarse grasses that the animals get their nourishment during the short Arctic summer, and on which they manage to exist during the long winter, even in the most northern lands.

The general bursting forth into leaf and flower of the many little plants

when the snow begins to melt under the power of the sun is a remarkable evidence of the latent power of life, and it calls forth the admiration and the gratitude of all Arctic travellers. The change from the deadly uniformity of the silent whiteness over land and sea in the long months of winter, to the browns and greens and many tints of the little flowers, with the sound of running streams, and the movement of the ship afloat, rouses the life in the seaman's heart, and gives him an indefinite feeling that the forces of life are stronger than those of inanimate nature.

Osborn (*North-west Passage*) gives the following vivid description of this burst of life in the land of frost:—

*Description of an Arctic Summer.*—"It is July in Prince of Wales Strait, the summer season of latitude 70° north; the *Investigator* has bent sails, hoisted her boats, and keen eyes from the mast-head watch the daily increase of water which is detaching the floe from either shore. The russet tints of the land on both shores have replaced the tiresome white of winter; the ravines are again silent, the *débâcle* has passed, and the waters only run now in modest trickling streams. Here and there, along the edge of some deep cleft in the land, the white streak of a pigmy glacier shows where the summer heats cannot penetrate; but on the sunny slopes, or in the sheltered valleys, the modest flora of the North spreads her short-lived store—lichens and moss—in rich profusion of species and colour. The lovely golden hue of the anemone and poppy, the purple-blossomed saxifrage, and white flowerets of the London-pride, appear interlaced with the rich green of the ground-willow, and the rose-tinted leaves of sorrel; all relieve the wanderer's eye, and carry him back with softened feelings to some nook in his own dear land, where the flowers and trees and herbs, though far surpassing in loveliness those before him, are yet not half so much appreciated. There was no night to overshadow this scene; the sun rose high during the day along the southern half of the heavens, and sloped without setting towards the north until midnight.

"Yet it must not be supposed that in the Arctic regions there is not a perceptible division of the day into that portion of it intended for labour and that for rest. Between the hours of eight in the evening and four in the morning, in spite of the sun sweeping through the heavens, there is a perceptible change; the light is more subdued, the tints of the land and sea less strong, shadows less marked, the birds go as naturally to roost as if it were dark, and nature is evidently reposing."

It is a remarkable evidence of a warm ocean current, combined with a fairly favourable soil, that Lieutenant Greely (*American Expedition*, 1882) found on the west side of Grinnell Land (about 81°–2° N. lat., 70°–80° W. long.) a country with lakes and rivers remarkably free from snow; and that in summer the valleys give birth to a comparatively luxuriant vegetation, which served as pasturage for musk cattle and considerable game. There was abundance of grass, willows (dwarf), beds of dryas and saxifrages; "butterflies added brightness to the scene, and bumble-bees and Devil's darning needles flitted about."

## Note 34, p. 298: GUNPOWDER IN ICE.

The *Enterprise* began her ice work in 1851 on the south side of Behring Strait. The captain, in a letter to the Hydrographer (Sir F. Beaufort), expresses his surprise at the massiveness of the floes to the south of those straits, and attributed it, not to the coldness of the season but to the north-east gales, which drove the floes out of the Arctic Sea through the straits.

He had to cut his way through them; and in this operation he came to the conclusion that gunpowder was not on the whole so effective as ice saws and ice chisels. He found that gunpowder was very good for blowing off corners of ice and such special dislocations, but in using it for making a channel through a floe it breaks the ice into large fragments, which coming to the surface again block the way, and are sometimes difficult to remove.

Sir E. Belcher says something to the same effect. In June, 1854, in trying to cut out the *Assistance* from her winter-bed in Wellington Channel, he made a saw cut in the ice (probably 7 feet thick), enclosing a square 40 feet by 30 feet, then he placed 10 lbs. of powder nearly under the middle, 18 feet deep; this broke up the whole square, but the pieces had to be lifted out of the sea on to the floe, amounting to 600 tons of ice, a heavy work. Two charges of 4 lbs. each, brought up the "cradling" (*i.e.* the bed of ice under the ship). The ship was finally released by cleaving through the ice accumulated about it, with saws and battering-ram and gunpowder. A wind or tide would soon clear away such broken pieces, provided there was an opening for them to go.

Dr. Armstrong (*Investigator*) records the breaking up of a floe 500 yards in diameter and 12 feet thick, with 36 lbs. gunpowder placed underneath the centre; that was in August, and there was water space for the pieces to float away; and in September, 1851, when the ship was imbedded in a hummocky floe, 250 lbs. of powder placed under 16 feet of ice produced cracks in the hummock 35 and 67 feet thick. This latter was an example of favourable application.

Gunpowder, however, has proved a very valuable friend to the Arctic voyager, both in getting ships into safe winter quarters, and in getting them out again and clear of ice, when other means of escape from their prison seemed hopeless. It was constantly employed in every expedition on the breaking up and resetting of the ice every year.

The following notes on the application of gunpowder to this purpose will therefore be interesting, and perhaps useful, to future voyagers in ice regions, not having been previously published. They were drawn up by

Admiral Sir L. M'Clintock a few years ago for a public purpose; coming, therefore, from so experienced an authority, his consideration in allowing them to be inserted here will, no doubt, be appreciated.

*Notes on Blasting Thin Ice, as usually practised in Arctic Expeditions, by Admiral Sir L. M'Clintock.*

The method is simple, efficient, and inexpensive. Charges of coarse-grained gunpowder, varying from 1 to 5 or 6 lbs., are most commonly used where the ice does not exceed 5 or 6 feet in thickness.

Not being provided at all times with regular blasting cases, the powder was often put into preserved meat tins, or even into wine bottles, the cork or bung, through which the Bickford fuze was inserted, being rendered water-tight with luting. The fuze, which burnt at the rate of 2 feet per minute, was cut to a length of rather over 12 inches.

The blasting tin was attached to a line of sufficient length to suspend it at the required distance beneath the ice, the other end being secured above the ice. When quite ready the fuze was lighted, and the blasting charge lowered quickly down.

Rows of holes have sometimes been bored through the ice; and charges lowered through these, if fired simultaneously, would be very effective.

Ice of 4 feet thick so treated, with 2-lb. charges suspended 2 or 3 feet beneath the ice, may be expected to produce cracks for several yards from each centre of explosion.

On one occasion a saw-cut 216 feet long was made parallel to, and 30 feet from, a nip (*i.e.* the forcible contact of the meeting edges of two large floes or fields of ice), and four transverse cuts were made at almost equal distances between the long saw-cut and the nip; five 2-lb. charges were exploded in the space. The ice (about 500 or 600 tons) was thus broken up; it was cleared away, and the ship passed through between the ice-fields before they closed again.

When the wind or current favours the removal of the ice broken up by the blasting charges, a channel may be very rapidly cleared.

A 16-lb. charge lowered 10 feet beneath 5 feet ice has broken up a space 400 yards square, also cracked the ice in several directions for a distance beyond.

4-lb. charges are frequently used some 7 feet below 4 feet ice, and generally with very good effect.

Where ice is less than 2 feet thick, or is much decayed, 1-lb. or 2-lb. charges are most frequently used. They should be placed where the ice would offer the greatest resistance. When this is judiciously done, and the charge lowered just so far down that the whole effect is expended upon the under-surface of the ice, the maximum effect is produced; no fragments are blown up, and the most extensive cracks are formed.

No very precise directions for proportioning the charge and its distance below the ice can be given, for the effects vary greatly; but as a rule it has been observed that, firstly, if the blasting charge is too close up to the

ice, only a small hole is produced above; secondly, if too far below it, no useful effect is produced.

Sea ice has so much elasticity that it will sometimes undulate and lift considerably at each explosion without being cracked or broken, except immediately over the charge.

The holes are most quickly made by using boarding-pikes or long-handled chisels, three or more men working at each hole.

To contain the blasting charges cylindrical stout tin cases should be provided, with perforated brass screw caps, through which the fuze should be inserted, screwing tightly down upon india-rubber washers, so as to be perfectly water-tight.

The sizes and proportionate number of these blasting tins should be as follows where only thin ice may be expected:—

| | Number. | Diam. of Case (inches). |
|---|---|---|
| Two-pound . . . . . | 35 | 3 |
| Four-pound . . . . . | 35 | 4 |
| Six-pound . . . . . | 20 | 4 |
| Ten-pound . . . . . | 15 | 4 |
| | 105 Charges. | |

For 1-lb. charges bottles may be used. The diameter of the cases should be limited to 4 inches, otherwise a much longer time will be required to make the holes through the ice.

It may be necessary to ballast these cases, to ensure their being heavy enough to sink, for this depends upon the weight of the case, and whether it is quite filled up. Putting in some dry sand before filling up with powder has been resorted to, but it should be ascertained and provided for beforehand that they shall be quite heavy enough to sink by their own weight when filled for use.

F. L. M'CLINTOCK,
*Retired Admiral.*

Captain R. Stotherd, Royal Engineers, on the occasion of the fitting out of the *Enterprise*, gave a memorandum on the application of gunpowder for blasting ice, but, being treated necessarily from the theoretical side of the subject, it is virtually superseded by Admiral M'Clintock's practical experience. But there is one suggestion Captain Stotherd makes which may be useful to travellers in the ice, and that is:—

"Waterproof powder-bags, made of sail canvas No. 1: height and diameter in proportion to the purposes for which they are to be used and the quantity of powder they are to hold. They should have a neck like a bottle to admit the fuze, and be filled with dry sand, to keep them distended while being paid over with waterproof composition. When filled with gunpowder the fuze should be inserted in the middle of the charge, and the joint secured by canvas or tape made fast with shoemaker's thread, and paid over with the waterproof composition.

"Waterproof composition: 1 lb. pitch, 2 oz. bees-wax, 2 oz. tallow, melted over a slow fire, but not allowed to boil.

"In order to produce the greatest effect it is desirable that the powder be lodged as compactly as possible; the length of the powder-bag should therefore be, as nearly as can be, equal to the diameter.

"For the purpose of firing charges a large supply of Bickford's fuze should be provided, of the quality called sump fuze, which burns under water. It is about $\frac{3}{10}$ inch thick, and burns at the rate of 2 feet 5 inches per minute. It should be tested when received and when preparing for use."

## Note 37, p. 50: MR. MIERTSCHING (the Eskimo Interpreter).

It should have been stated, in a note at the above page of the Journal, that this gentleman had been engaged to go on this expedition, but that in consequence of the suddenness of the notice he was not able to join it until the vessels arrived at Plymouth. Osborn says of him: "The proposal had been suddenly made to the worthy man one day when he was enjoying his ease in a quiet village in Saxony, after returning from a long sojourn in Labrador as a Moravian missionary. He accepted the offer, and was dispatched forthwith as fast as rail could take him to London. The Admiralty sent him a few hours afterwards by express to Plymouth, and he arrived only just in time to be tumbled into the *Investigator* before her departure." (*North-west Passage.*) As stated in the Journal, on the junction of the vessels at Magellan Strait, it was intended that the interpreter should join the *Enterprise;* but, finding he was comfortably settled in the *Investigator*, he was left on board of her, and consequently remained there throughout all the movements and final abandonment of that vessel.

END OF APPENDIX.

# MEMOIR OF ADMIRAL SIR R. COLLINSON.

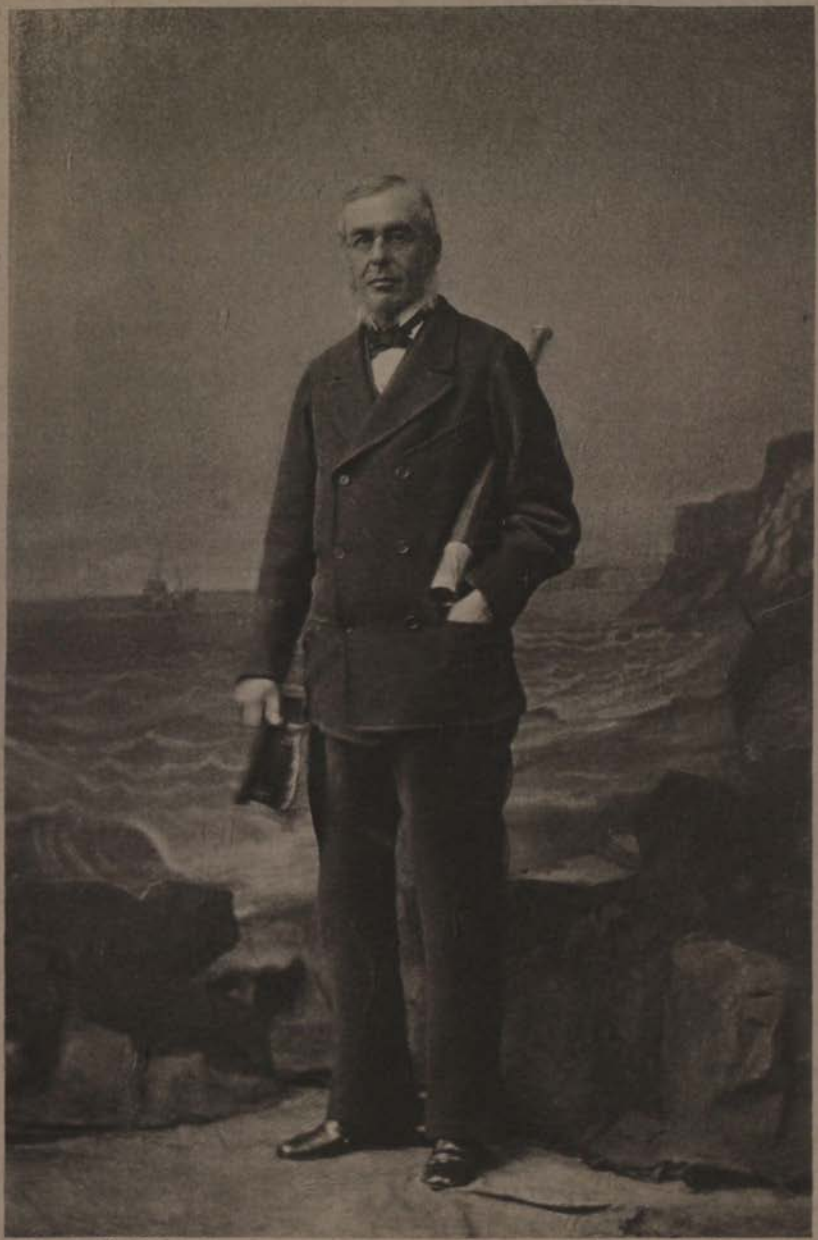

Photo by Maull & Co 1876. Photogravure by Annan & Swan

Journal on board the Enterprise
from December /49 to December /53.

Rd. Collinson

# MEMOIR OF ADMIRAL SIR R. COLLINSON.

## Editorial Explanation.

In the preparation of this Memoir the Editor has to express his acknowledgments to various friends and colleagues of the late Admiral. The Deputy Master, Captain Sir Sydney Webb, K.C.M.G., and the Secretary, Mr. I. Inglis, and other Officers of the Corporation of the Trinity House, have supplied him with information about the works carried on during the Admiral's tenure of office as Deputy Master, and concerning the constitution of the Corporation. To the Secretary of the Royal Geographical Society (Mr. H. W. Bates) he is indebted for an account of that institution (compiled by Mr. C. Markham in 1881); and to the Secretary (Captain Burgess) and the Librarian (Colonel Day) of the Royal United Service Institution, for cordial assistance.

By the liberality of Major-General Brackenbury, C.B., R.A., head of the Intelligence Department of the Army, and by the kindness of Major Murray of that branch, he has had the opportunity of consulting the records, lately compiled, of the Chinese War of 1840–42, which is the most complete account of that affair that has been made. And for that chapter of the Memoir he has also been much indebted to the account of 'The Chinese War,' published in 1844, by Lieutenant Ouchterlony of the Madras Engineers, who did good service during the operations. This was the fullest and best account of that war published at the time.

In acknowledging the ready and valuable assistance given by these gentlemen, the Editor must be careful to point out that they are in no way responsible for any opinions grafted thereon.

## CHAPTER I.

### OVINGHAM.

*The Foundation.*

"The lives of all [good] men remind us
We can make our lives sublime,
And, departing, leave behind us
Footprints in the sands of time—

"Footprints which perhaps another,
Sailing o'er life's solemn main,
Some forlorn or shipwrecked brother
Seeing, may take heart again."

THE memoirs of any man who has been in the state service of the country should only be put before the public when either his services have been of exceptional value, or when his character affords a bright example to succeeding generations. In the case before us, that of Admiral Sir R. Collinson, there are neither extraordinary public services to recount, nor is there such a deeply impressive character to record, as would of either alone justify the publication; but there is, nevertheless, a certain combination of those two requirements. A long-continued and approved service of special kind, which seems to have been distinctly the result of a sound and well-trained character, and which affords an example of steady perseverance and self-discipline, has some elements in it of a kind likely to give support and encouragement to many an officer who finds his duties heavy and his prospects cloudy. His character and his services together are a fair illustration of the idea of life—not the highest, but the more general one—which appears to have been in the mind of the poet Longfellow when he wrote

that "Psalm of Life," from which, with one pardonable alteration, the above quotation is taken.

Richard Collinson's character was one fairly typical of the well-bred Englishman of his day. His main characteristics were a ready perception of the important points of any matter before him, and a plain strong sense of a practical way of dealing with it, fitting to the occasion. Added to these he had the inestimable advantage of a good training in the idea of duty to the Almighty Father and to his country, in a home unsurpassed for hearty affection and lively occupation; further, he was blessed with the inheritance of a slight active frame, a good appearance, and a sound constitution. He had no accomplishments and no special gifts for any of the Sciences or Arts, so little indeed that to the last he regretted his want of faculty as a draughtsman; and he was launched into the world at twelve years old, with very little learning of any kind: and yet his character and conduct very early brought him into notice, and gave him a status in the Navy which mere acquirements would have failed to substantiate.

But, to appreciate fully the character of a man and its effect on his life, one should know something of the family from which he was derived. Richard Collinson came of a good English stock on both sides. His father belonged to a family which for some generations had lived on their own property in Westmoreland, a specimen of the small independent farmers called "statesmen" in those counties; and where some of them remain still, but unfortunately for the country, now in a condition of struggling against free trade. His father's father was a clergyman, and brought up his son to the same service; and he, having had a good education at Winchester and Oxford (at which latter place his uncle, Dr. Collinson, was Provost of Queen's College), and being of a studious and yet practical mind, lived and died a "parish priest" (as he called himself), in the mining and manufacturing district near Newcastle-on-Tyne; remarkable in the diocese for his sound religious ideas and his sensible advice, and his kindly ways. The mother belonged to two good

families, the Kings of Bristol and the Bernards of Buckinghamshire: the former of whom had, in the earlier days of the Reformation, given three Bishops to the Church; and the latter had supplied the Governor to the Province of Massachusetts at the time of their rebellion against the parent country, and also a more known person, the Sir Thomas Bernard who was one of the founders of the Foundling Hospital and of the Royal Institution. Coming of such fair English stock, the mother inherited the qualities of both: the refinement and love of Art and interest in public life of the Bernards, with the simplicity and kindliness of the Kings, to which she added an unbounded generosity and charm of manner all her own. Of her it was said, by a good judge, when well past sixty, that "she was the only person he had known who had successfully cultivated the extraction of sunshine out of cucumbers."

Such a character, so well bred and nurtured, seemed designed by nature for the Naval Service of his country; and yet it was an accidental circumstance that suddenly pitched him into it, straight from his first school.

### *Ovingham.*

"Dear old Ovingham," as its *alumni* spoke of it with fond recollection for years after their departure; and with good reason, for it was perhaps the most delightful of all the schools of that age for the young boys of the last two generations. In those days education meant something besides book-learning, and Ovingham was distinguished in the counties of Northumberland and Durham for giving youngsters a sound training in its wider sense.

The little village of Ovingham is placed on the north bank of the Tyne, about 12 miles above Newcastle. The "coaly Tyne," like all the streams of the two "carboniferous" counties, is remarkable for the picturesqueness of its valley from source to mouth, redeeming by its charm the unloveliness of the rest of the land. During this century it is true that the thirst for converting the "black diamond" into yellow gold has laid a perpetual murky coating over sky and

earth along its lower course, and has even invaded the pleasant banks of Ovingham itself, but the upper regions of its two branches and their tributaries have their natural beauties still untouched, as may be seen by any traveller along the railways that follow their courses. Ovingham must have been always an important place on the river, on account of the ford there; probably even in the Roman days, as the renowned wall came close to the river near that point. The banks rise from the river to a height of some 50 feet, picturesquely broken and wooded. Along the top of the north bank lies the primitive little village; prominently in the centre stands the old church, quite Saxon in its character, and close to it, overlooking the river, is the house occupied by the Vicar, or "manse," as Northumbrians then called it. To the westward the ground falls to a subsidiary little valley, through which runs what we boys thought the "burn of burns," full of every aqueous charm for our especial gratification; and in the upper waters of which was a ravine clothed with wood, a good-sized plantation, no doubt, but to us a region of unlimited adventure and inexhaustible discoveries. On the further side of this burn was a large farmyard, worked under the care of the Vicar's son, and a daily source of instruction and occupation to us; and also, what was of still greater interest, the Vicar's own garden, abounding in delicious fruit trees.

On the opposite banks of the river, on a spur isolated by ravines, stand the ruins of the Norman occupation of that country, characteristically on the south bank, and not, like the Roman wall, on the more dangerous north—Prudhoe Castle, an outlying possession still remaining of the vast dominion of the Northumbrian earls.

Looking down on the river from the Vicar's garden was a scene of perpetual delight and interest, in the ford and the ferry-boat; always associated in our minds with the possibility of having the oar put into our hands and so being compelled to ferry for ever after. And the deep and wooded pools above and below it were memorable to us, not for the fish drawn out, but for the little white bodies put in.

In the village were all the institutions of a primitive northern hamlet: the wheelwright, who made our stilts; the cobbler, to whom all new boys were sent to ask for some "strap oil"; the goody shop where that hard-eating compound appropriately called "claggum" was produced; the byres and the middens, and the village ovens; and the little school, where the church choir, three or four stalwart men, with pipe and fiddle, shouted and stamped in harmonious zeal.

The school was kept by the Rev. James Birkett, then Vicar of the parish, but better known in Ovingham as "the Maister." When R. Collinson was there he was an old man, having been keeping school for a good many years, during which the scions of all the Northumbrian and Durham houses had come thither, to receive their first training outside the domestic circle. What book-learning was given them the present deponent, notwithstanding his own personal experience, recollecteth not; "a little Latin and less Greek," judging by subsequent light, and one of the three R's ("Wrighting," as R. C. calls it), was evidently not in the course. In justice, however, to the memory of the good Maister it must be recorded that in his reports he speaks of getting young Richard into Greek as soon as he has mastered the Latin Syntax. But of some other educations of character, discipline, self-control, religious tone, and healthy exercise, the old Maister managed to impress a good deal on his young pupils. A kindly old gentleman, with a hobby for making walking-sticks, which he could apply with effect on the palms of idle hands; and greatly aided in his care of the boys by his wife, a handsome old lady with a stick, much respected and yet loved by us all. Whatever we failed to learn in school was compensated for by our zeal in acquiring out-of-door knowledge, in fishing and hunting birds and beasts of small degree, helping in the farm and orchard, keeping rabbits and building huts for them, and braving Tyne's waters on stilts.

The boy was evidently loved by the old man, both for his conduct and character; he writes to the father, "You have

the happiness to be father to a son of a mild and humane disposition, and of intuitive abilities; he outstrips his congeners . . . God has indeed blessed you with deserving children." And, judging by his subsequent letters from far-off seas, the embryo admiral had a great love and respect for the old Maister, and the Mistress, and was apparently a leader in the school indoors and out. One instance of his early forethought and decision of character is recorded. It was the way of the school to keep up all old customs; on certain days certain ceremonies were to be performed and certain things to be eaten. One of these festivals, very dear to all schoolboys of those days, was the barring out of the master from his own schoolroom on the last day of the term. It was a race between master and boys which should first get possession of the room, a race in which our good old Maister always managed to be last. The door was barred with a bit of iron prepared, and the boys, with such provisions as they had got, remained in possession till bedtime: a somewhat weary victory, in which they figured more like prisoners than conquerors. When young Richard arrived at home, he told the story of the fight and showed the bar that did the trick. "What did you bring that for?" said his father. "We may want it again," said the careful ringleader.

## CHAPTER II.

### H.M.S. CAMBRIDGE.

### 1823–1827.

WHEN Richard was about twelve years old, and still at Ovingham, studying the art of keeping schoolmasters out and rabbits in, a Captain Maling, R.N., happened to pay a visit to the neighbourhood of Newcastle; he was just appointed to a line-of-battle ship, the *Cambridge*, then fitting out for the Pacific Station, which at that period meant the west coast of South America. In those simple times, long anterior to competitive examinations, a post captain, when appointed to a ship fitting out, had a certain latitude about nominating midshipmen; and Captain Maling having a vacancy in that class of his officers, offered it to a friend of his in the North for one of his sons. That friend for some good reason declined the offer, which was then suggested to the Rev. John Collinson, of Gateshead, he having at that time four sons of various ages. It is perhaps doubtful whether the studious clergyman would have entertained a proposal so different from his own life and training, but the spirited and loyal-hearted mother had no hesitation about giving up a son to serve his king and country on the high seas. It was, no doubt, a far greater pang to her than to the father to part suddenly with so young a boy, and one which many loving mothers would have refused to undergo; but her trust in doing what seemed the duty of the moment was great, and she was rewarded for it by the devoted love of the son she sacrificed for full fifty years afterwards. So the boy was fetched from school, and, without any hesitation on his own part, was taken straight away on the top of the "Highflyer" coach to London, and put into the gun-room of His Majesty's

ship *Cambridge* at Chatham—a simple though summary mode of entering the Royal Navy, which some *Britannia* cadets may envy; they may be consoled with the reflection that the little Ovingham boy could hardly have passed any examination whatever.

While on this duty his father, or rather his enterprising mother, made another good stroke for the benefit of the boy. The *Cambridge* was in want of a chaplain, and the mother, in the absence of her husband, persuaded one of his curates to accept the post, not, however, without assurance of his fitness for it. The Rev. Hugh Salvin was indeed a remarkable man in his way; omnivorous in his learning, whether classical or scientific, and oblivious to the ordinary concerns of life, but withal so simple and earnest and kindly that he gained the regard and esteem of all he came in contact with. To such a man the attraction of visiting strange countries in a man-of-war counterbalanced the troubles of a sea life; and in the end the adventure succeeded so well, that after a meritorious service afloat he lived for many years an honoured incumbent of a Greenwich Hospital living, at Alston in Cumberland.

From this time forward, during the whole active career of Richard Collinson, we have a record in most of his private letters, carefully preserved by his mother. He very soon took to his new life. The father writes: "Richard in uniform, looking healthy and handsome, and with his usual countenance. He thinks everything right—all amusement—sleeping in hammock—climbing masts. He no more minds going to sea than I do travelling from Newcastle to London, nor so much. Capt. Maling says he never saw a boy take to it so well. I left him at six this morning; kissed him and wished him good-bye; he seemed a little melted, but in a quarter of an hour afterwards was fast asleep. You have, my dear wife, made a fortunate destination for him." It was 3½ years before the ship arrived in the Medway again, a long trial for so young a lad, especially one so fond of his happy home; but neither in his letters nor in any other way did he show anything but a determination to stick to the sea all his life.

The voyage down the Channel was, of course, a trial; seven days between Chatham and Portsmouth was not a cheerful beginning; but he consoled himself by being in his hammock in good company of several of his brother mids, and by the captain's wife being a joint sufferer. The regulations of the Service which permitted the presence of Mrs. Maling (as a passenger) were of much benefit to the midshipmen, to whom she showed a thoughtful kindness during the cruise.

His letters during this voyage are specimens of bad spelling and worse writing, such as would shock a Naval Examiner in these days; but there is in them the germs of the future surveyor, a quick and accurate observation of places and dates, and a self-dependence and willingness which led his superior officers to depend upon him; and with these a decision which gave him a good place among his fellows. One of his first displays of character was fighting another mid who said something disparaging about canny Newcastle. They touched at Teneriffe, Rio Janeiro, Monte Video, and then to Valparaiso, where their duties commenced. At that time the Spanish Government was making its final efforts to preserve its colonies in South America, and, although the British war vessels could not interfere directly, the good wishes of their crews, as indeed also those of the Home Authorities, were strongly in favour of the "Patriotic" side, as the colonists chose to designate themselves. The celebrated General Bolivar was then leading the Peruvian colonists on to independence, and several English officers were serving on the Patriotic side; among them General Miller, to whom our young mid was indebted many years afterwards for assistance, when he was on his way to the Arctic seas, and General Miller was British Consul-General in the Sandwich Islands. The young gentleman's observations on the Peruvians are not complimentary, but he had the acuteness to perceive that the Chilians would prove eventually the strongest people on that coast, owing to their more bracing climate; he had an opportunity, however, on a subsequent voyage, of observing that the title of "Patriot" does not of itself give independence and energy to a people.

The ship's time was chiefly occupied in calling at the different ports along the coast. After nearly a year of this he feels himself a sailor, and can remark that "the good ship Collinson is getting her cargo in very fast, being when she left England only 4 ft. 10 in., now 4 ft. 11 in. exactly." The matter of height was rather a tender subject in reference to a younger sister, for a year after he says: "I top the officer over you, being 5 ft. 1½ in.," an assumption he found he had to draw back from on his return home. By April, 1826, he has quite made up his mind—"I would not change now for anything; *always* preferred true blue to scarlet." And with the complacent superiority of a naval officer of fourteen he tells his sisters, "I wish you could see a line-of-battle ship, it would be a very fine sight *to you*." On rounding Cape Horn again to return home, the feelings of the young sailor are roused by the grand combination of stupendous land and ocean scenery: "Through the Straits of Le Maire it was a most beautiful sight —the tremendous waves foaming along through the passage, the tops of the mountains covered with snow, and the land at the water's edge covered with trees in full bloom." The same letter gives exact dates and places, and other nautical records, which mark the budding navigator. He mentions the passage of H.M.S. *Blossom*, Captain Beechey, on her way to Behring Strait, in the hope of meeting Captain Parry, then attempting the North-west Passage, little thinking that about thirty years after he would be bound on a similar expedition to look for Sir J. Franklin.

Altogether his letters show a considerable advance in thought and expression since crossing the Atlantic the other way three years before. Much of this was, no doubt, due to the attention paid to his education on board by the kind and learned chaplain. When middies were so young, a man-of-war was a naval school, and the captain a sea warden; at least Captain Maling was; Richard writes gratefully of his kindness in allowing the midshipmen to sit in his cabin from 6 to 8 p.m. to study, besides giving it up to them in the morning for their regular lessons under the chaplain. The nature of these will

probably surprise the cadets of the *Britannia*, for our young friend says: "Mr. Salvin won't let me go into French or Spanish until I have finished my Latin and Greek." When he did arrive at those modern tongues the result was not so satisfactory as he anticipated: "I can't come this foreign lingo"—a conclusion that remained true to the end of his life. There was also mathematics, or so much of it as conduced to the better understanding of navigation, and to that subject the young man took more kindly. It is also evident, from his casual remarks, that he had carefully read the various books that had been given him on his departure; and on more than one occasion he found the Latin he had imbibed from Mr. Salvin and old Mr. Birkett of good service in interpreting with Spaniards and Portuguese priests.

His peculiar qualities for sea service were already developing themselves. A nautical surveyor, or navigator proper, should have a quick perception of the local conditions about him, and a good memory for the details of them; he should also have staying power, *i.e.* a cool head and a resolute heart, for he is the pilot who has to weather the storm. R. C. had the germ of these qualities in him, and therefore he took to surveying as a duck takes to water; he was deficient, however, in two other important points—Imagination and Art: two faculties which are, perhaps, out of place in a navigator; nevertheless, the want of them both was a loss to him in after years, when he came to deal with other and higher duties. He had, however, enough imagination or native enterprise to have the ambition of rising to the top of the tree in the main or combatant line of his profession.

The *Cambridge* arrived at Sheerness in June, 1827; but the young seaman, anxious as he was to enjoy the delights and the honours of his expectant family, was quite ready to go to sea again; and, with the experience of three years' service, began to impress on his father the necessity of using all the private interest he could raise to get him into another ship. In November, 1827, he being then sixteen years old, we find him on board H.M.S. *Gloucester*, at Sheerness, looking out for active service somewhere; his professional instincts

turned towards the *Chanticleer*, a small vessel then fitting out for a special scientific voyage at Portsmouth, and his father, who never thought of employing private interest for his own advancement, had no hesitation in urging it for his son. Personal influence in the matter of promotion and employment in the Army and Navy has always existed, and will continue to exist, because it is inevitable and really necessary; but it was somewhat rampant at that time, owing to the number of officers still unemployed, in consequence of the sudden relapse from a violent war to a profound peace.

Fortunately for the young navigator, he had some influential friends who helped to put his foot on the ladder of reputation; the climbing up afterwards he managed to do pretty well by himself. The Vice-Chancellor of England, Sir L. Shadwell, was one of these, an old and dear friend, and subsequently connection of the family; his house was the resort in London of all members of it coming in from the country on business, a no small advantage in those days of difficult journeying; and his personal and professional influence greatly helped not only the sailor son, but another one after him, viz. the present writer, to get a good start in their lifelong professions. Another friend was Admiral Sir Byam Martin, also a distant family connection, and who, through the kindred families of Fanshawes and Stopfords, had powerful naval influence at that time; and who, moreover, at that moment was a high official in the Admiralty. It was he who, by his personal application to the captain of the *Chanticleer*, finally secured a berth for Richard Collinson on board of her, and also enlisted the interest of the captain in the young aspirant, and thus virtually launched him in the surveying career by which he rose to honour. Moreover, the young gentleman had earned the good opinion of his late captain, who took an interest in him to the end of his life. He (Captain Maling) wrote to R. C.'s father, on his return home, of the sailor son: "As excellent a good fellow as you could wish him to be. He has his first fault to commit with me; on not one single occasion has he given me an oppor-

tunity of finding fault with him. A better-disposed lad, or one more likely to do credit to his profession, never trod the deck of a ship. If he continues through life what I have found him, his parents will have reason to be proud of him."

Before, however, that desired appointment took effect, a short period of anxiety had to be passed; for the *Gloucester* was suddenly ordered to the coast of Portugal to assist (in the French sense, by looking on) at the war then in progress between Dom Pedro and Dom Miguel for the throne. Happily for the state of mind of R. C. (fully expatiated on in his letters from Oporto), the *Gloucester* returned home before the *Chanticleer* was ready, and to his agreeable surprise he then found that a midshipman's berth in it had been all the while kept vacant expressly for him.

## CHAPTER III.

### H.M.S. CHANTICLEER.

### 1828–1831.

ABOUT that time there was a considerable stir in the Naval Department of the State towards enterprises for scientific purposes. The sudden cessation of extensive war action in 1815, with the prospect of an indefinitely long peace ahead, threw upon the hands of the Government a great many ships and a multitude of men for whom no employment was to be found. This plethora of establishments wanting work went on, notwithstanding the economical sacrifice of men and material, for twenty years; and during that period there came out of it at least this one counterbalancing good, that various works for the benefit of science in particular, but of mankind in general, were performed by the Government, which would otherwise never have got done at all. Under the friendly pressure of the Royal Society and other kindred institutions, various expeditions were undertaken by the Admiralty for surveying, exploring, and making scientific observations; and the energies of the Navy, so long turned to war, now found some opening in peaceful enterprises.

From the termination of the great war we begin to date the renewal of Arctic Expeditions, and of the naval surveys and explorations which have since made British charts the general guides of the ship world.

This voyage of the *Chanticleer* had two objects: one, to determine closely the longitude of some of the chief places in the lines of sea traffic. It is easy for any one to find the latitude wherever he may be, if he can take the altitude of the sun with a sextant; but to find the longitude requires

a good calculator and a good chronometer. What the navigator wants to find out when he is on the high seas is what o'clock it is at Greenwich when it is noon where he then is; for this gives him his longitudinal distance from Greenwich; and to find this he carries with him a chronometer set to Greenwich time, and then by astronomical observations determines the exact moment of noon where he is. But chronometers, like all other clocks, are kittle cattle to deal with, having vagaries incomprehensible to sea captains; when therefore he can touch at a place of fixed longitude, he knows there ought to be a certain difference between Greenwich noon and the noon of the place, and can therefore judge how his chronometer is going, and proceed on his voyage with more certainty. For the effective determination of the longitudes the *Chanticleer* carried twenty chronometers.

The other and more scientific object was to determine the rate of oscillation of a pendulum at various places lying between the equator and the poles. It had been accidentally observed that a pendulum-clock taken from Paris to near the equator lost time, *i.e.* the pendulum oscillated more slowly. Now a pendulum oscillates because of the attraction of the earth, and the force of this attraction is in proportion to the square of the distance from the centre of the earth. It was therefore reasonably concluded that the retardation of the pendulum at the equator proved that the diameter of the earth was greater there than at Paris; and the corollary to that clearly was that the correct determination of the rate of oscillation of the same pendulum at a good many places on the earth's surface would help to a knowledge of the correct figure of the globe. This expedition therefore was something more than an ordinary surveying cruise.

The officer selected to conduct this service was Captain Henry Forster, a man of high scientific character: he had been with Parry in his Arctic voyages both to look for the North-west Passage and to Spitzbergen, and was highly thought of by that explorer; and for his scientific acquire-

ments he had received the special honour of the Copley Medal and the Fellowship of the Royal Society. He appears to have been a good officer, but a reserved man, and was not in good health during this expedition; his untimely death towards the end of it was mourned by all on board, and especially by Richard Collinson, to whom he was invariably kind and attentive. An exceedingly good and readable account of the voyage was published by the surgeon of the ship, Dr. W. H. B. Webster, at the time, "to which," says young Richard complacently, "we have all contributed our mites."

The *Chanticleer* was a 10-gun brig (but barque-rigged), of 237 tons, with 15 officers and 42 men; and though Richard Collinson speaks with pride of her being such a capital sea-boat, the Doctor informs us that her popular designation was "His Majesty's bathing machine." This was probably the happiest three years of R. C.'s active service; the vessel was large enough to be fairly comfortable for her complement, and the number of officers (eight in the gun-room mess) sufficient to be a friendly party, as they appeared to have been. Here he made some fast friends for life, such as Lieutenant Austin (the first lieutenant), whom he afterwards served under, and Mr. Williams, whose services are mentioned by Dr. Webster.

They left Portsmouth on April 27th, 1828, and touched at the Cape de Verd Islands for longitude observations, and from thence crossed the equator to the island of Fernando Noronha, off the coast of Brazil, and from there to Rio Janeiro, and then to Monte Video (August 15th to October 5th), where the *first pendulum observations* were made. These were taken by the captain and lieutenants, and as the number of oscillations had to be ascertained for a whole day of twenty-four hours, it was a work of patient care to avoid errors. Wherever these were taken a small wooden observatory was erected on land, and tents set up for the observers and guard. To the midshipmen was relegated the observations on the force and amount of declination and dip of the magnetic needle; in which young Collinson took a prominent part.

The *second pendulum observations* were made at Staten Island, near Cape Horn (October 25th to December 21st).

From there they touched at Cape Horn, and then, in order to make the most of the summer season of those latitudes, they went to their extreme south position, Deception Island, near Cape Possession, South Shetland, S. lat. 63° 26′, and W. long. 64° 6′; where they remained from early in January to March 8th, 1829. About latitude 60° they began to meet with those fleets of icebergs which are a distinguishing mark of the South Polar seas wherever they have been approached, and which are one of the great evidences to Arctic travellers of an extensive South Polar continent. On one occasion more than a hundred were counted in sight. These are the advanced guard of the main body which appears to surround that continent like a mountainous wall of ice; Dr. Webster mentions some 300 feet high, and since then other voyagers have in the ice-wall itself found greater heights above water; and as the Doctor calculates that *one-seventh* only of the total height is above water, what an appalling idea it gives us of the thickness of that coating of ice which appears to cover the whole of the Antarctic lands.

The land at the South Shetlands appears to be mainly volcanic; the mountains rise to a height of 7000 feet. Deception Island is the crater of an old volcano, and our young friend Richard writes of the curious effect of the white snow alternating with the black scoria. During gales of wind, which from their experience is the normal condition of things there, the volcanic ashes are blown about so as to alter the appearance of the hills; and thus strata of ice are found below strata of ashes. A ship's gun they had brought on shore was buried 4 feet deep in one gale. And as there was an almost perpetual mist obscuring the sun, moon, and stars, and their tents were frequently blown down, the Antarctic regions were not looked upon with favour by the young gentlemen. The only relaxation was the catching of penguins, which "look at a distance like little children in white pinafores," and "invite you to kill them—running inland instead of to the sea," and are "as good as beef

when on two-thirds rations;" provisioning a 10-gun "bathing machine" was not so easy a matter then as now.

The *third set of pendulum observations* was made at Deception Island, and then they went to St. Martin's Cove, at Cape Horn, where they remained from March 27th till May 24th, 1829, taking the *fourth set of pendulum observations.* The South Shetlands gave them a final taste of their tempestuosity, by keeping the ship a week in getting out of the little harbour; "in 37 days' sailing we have been16 hove to."

The remarkable circumstance about Cape Horn is that the climate is much milder than one would expect from the icebergs and snowy mountains and tempests mentioned by voyagers passing it. Dr. Webster gives the explanation,—that it has a sort of private gulf-stream to itself, or rather a South Pacific stream, emanating doubtless from the equatorial regions, and flowing towards the South Pole, but diverted eastwards (similarly to the streams flowing towards the North Pole) by the effect of the rotation of the earth from west to east: an action which affects all streams flowing in a north and south direction, being, that the streams carry with them the velocity of the equatorial region into higher latitudes, where the relative rotation is slower, and thus they have a constant easterly trend.

Hence, Dr. Webster points out, there is really little frost and snow at Cape Horn; the vegetation is luxuriant, tropical birds, parrots and humming-birds, numerous; the Fuegians (to the astonishment of travellers) are unclothed. But there is a great deal of rain; the constant strong westerly winds coming over the warm sea deposit their burden of moisture on the mountains of the Cape, which rise to 2000 feet. And there is another effect of the frequent winds, valuable to voyagers, in the absence of fogs. These comparatively mild conditions extend to the Falkland Islands, though in a modified degree. But midshipmen can't live on humming-birds—"We had to take it in turns to go fishing" to eke out His Majesty's rations—and they were exceedingly glad to see the *Adventure,* surveying ship, Captain King, arrive at St. Martin's Cove with provisions for their use.

From Cape Horn the *Chanticleer* went across the South Atlantic to the Cape of Good Hope, 4200 miles in 27 days, carrying strong westerly winds all the way—no lack of "bathing"; the Cape realised its original name by keeping them six days outside, unable to enter the harbour. Here they remained from June 27th to Dec. 13th, 1829; and the *fifth set of pendulum observations* was made, and also magnetic and meteorological observations and others for latitude and longitude. They had the advantage there of a good observatory, from which they obtained assistance, and where R. C. made friends, who helped him on two occasions afterwards, in the *Plover* and in the *Enterprise*. Officers and crew all enjoyed their long stay at the agreeable and, to them, luxurious Cape Town, after roughing it at Cape Horn. Dr. Webster remarks on the great difference between the indolence and half-civilised condition of the Spanish colonists at Monte Video, and the industry, order and neatness of the Dutch at the Cape. Great Britain had been in possession of it then for more than thirty years, but it was still, as it is indeed to this day, mainly a Dutch population. And they had brought with them from Holland the elaborate care and completeness of their race in their handsome houses, well-arranged streets planted with trees, and their orderly industry in the country; and, he remarks, they had also brought with them the good nature and the hospitable, though somewhat rough, disposition of their race, a roughness which comes from a native dulness and want of refinement, which is more or less found in all the Teutonic peoples. Since that time the "Boer" of the Cape has earned for himself a fresh title to the proverbial character applied to that name.

From the Cape they went to St. Helena, "that huge sea fortress," the cliff top of some mountain of a more primeval continent, of which it and Ascension are the two remaining fragments. Here, notwithstanding there being no port or shelter for ships, they remained from December 26th to February 10th, 1829–30, taking the *sixth set of pendulum observations*. Originally taken by the East India Company as a place of call for their ships, this island is still retained

(like Ascension) by the British Government, as its occupation by another Power would make a weak spot in the line of our communication eastward.

Then to Ascension, a somewhat similar rock rising out of the sea, but lower and more varied and habitable than St. Helena; equally, however, without any safe anchorage for ships. Dr. Webster remarks on the dry climate, which makes it a favourable sanitarium for the sick from the African coast. Here they made the *seventh set of pendulum observations:* from February 14th to June 6th, 1830.

Then they crossed over to Fernando Noronha, a small island near Cape St. Roque, Brazil, which the Doctor describes as luxuriant in beautiful vegetation; and made the *eighth set of pendulum observations:* June 12th to July 18th.

Then to Maranham, a harbour on the coast of Brazil, where they made the *ninth set of pendulum observations:* July 23rd to September 5th; after which they entered the mouth of the Amazon River, up to Para, where the *tenth set of observations* was made; and also acquaintance was made with the native Indians of that river, of a "good firm copper colour, with long black hair, and intelligent, mild features, superior to the negro slaves," but the Doctor would probably have allowed that they are not superior to the negro race in vitality.

From there they went to Trinidad, where they again luxuriated in the comforts of a British settlement, and remained a short time to make the *eleventh set of observations.* Then, touching at La Guayra, on the N. coast of America, they went to Porto Bello, "a small but secure and accessible harbour" on the Atlantic coast of the Isthmus of Panama; near the eastern terminus of both the existing railway and the canal now being constructed across the isthmus.

Here they remained during January, 1831, making the *twelfth and final observations on the pendulum,* and also endeavouring to determine the exact difference of longitude between that place and Panama by observing simultaneously the flash of rockets fired from conspicuous hills on the isthmus. These, however, were not very successful, only.

one set of rockets, fired from Gorgona, about midway between the two places, having been satisfactorily seen. A few years afterwards, Captain Belcher, in the *Sulphur*, attempted the same experiment from the Panama side, but although he was more successful, he came to the conclusion that it was not a satisfactory way of determining differences of longitude.

Captain Forster's untimely death cut short the remainder of their expedition. While passing down the river Chagres in a small canoe, he carelessly sat on the low and slight roofing over the centre of it, which, giving way under him, precipitated him into the water, and although two of those with him immediately jumped after him, he disappeared under water, and his body was not found until some time after, when searched for by Mr. Collinson. The officers and crew of the *Chanticleer* showed their feelings on the sudden loss of their greatly respected head by putting a monument to his memory at Chagres.

The *Chanticleer*, then under the command of Lieut. Austin (who long after commanded the expedition in search of Sir J. Franklin in 1850), on her voyage home touched at Jamaica, Cuba, Bermuda, and St. Michael's, and arrived at Falmouth May 17th, 1831.

### *Report on Pendulum Observations.*

Dr. Webster gives in an Appendix a summary of the report on these observations made by Mr. Bailey, then President of the Royal Astronomical Society. There were four different pendulums provided for this expedition, and apparently at each station three of these were swung; observations were also made before starting at London and Greenwich, and on returning at London. "The most extensive series of pendulum observations ever made."

Mr. Bailey gives a list of seventy-nine different sets of pendulum observations made by scientific men in different parts of the world, and says: "The results prove incontestably the powerful effects of local attraction on the pendulum, since the differences are, in many cases, much greater than any which would arise from error of observation."

"These show most clearly that there is some local influence on the pendulum, with the exact nature of which we are at present unacquainted, and which baffles all our efforts to deduce the true figure of the earth from pendulum experiment made at a few places only." Again: "The force of gravity seems to be greater on islands situated at a distance from the mainland than it is on continents. Such islands are for the most part of volcanic origin, and consequently formed of dense materials."

From all these observations Mr. Bailey reports the following results:—

| | Of the Equatorial Diameter. |
|---|---|
| Three foreign voyagers, Leutke, Duperrey, Freycinet, make the compression of the earth at the poles to be about . . | $\frac{1}{267}$ |
| Two English voyagers, Forster and Sabine, make it about . . . . . | $\frac{1}{289}$ |
| And Professors Bailey and Airey make the general result of all known experiments (at that date) to be about . . . | $\frac{1}{284}$ |
| The results from measurements of arcs of longitude (Sir J. Barrow, Arct. Voy., 1818–46) being . . . . . | $\frac{1}{306}$ |

An abstract of a report on *The Chronometer Observations for Longitude*, by Dr. Tiarks, is also given in the Appendix. The reporter remarks on Captain Forster's skill and indefatigable industry: only two mistakes of any consequence. The chronometers do not seem to have retained their rates for any length of time; "some of them have repeatedly altered their rates to a considerable amount in very short intervals." They were suspended from the deck, a mode which both Captain Forster and Dr. Tiarks disapprove of.

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This voyage determined R. Collinson's line of naval service; he found the scientific duties of the surveying department suited to his particular qualifications, and, thanks to the care and attention of Captain Forster, he advanced himself so

well in the special requirements of that branch, that he never afterwards had any difficulty in finding employment under the Hydrographic Office. At the same time, he always strenuously insisted that he would be a "combatant" officer, ready to take his place in any war operations.

When he returned he was twenty years old, and had therefore passed the boyish period. About this time he formed the handwriting to which he adhered during the rest of his life: a somewhat formal hand, evidently not obtained without labour, but, like all his pen and pencil work, clear and exact. His charts were all of this precise and careful character, and always were to him a work of labour and anxiety. The best evidence of his progress in his profession was that at Trinidad, in 1830, Captain Forster offered him the post of acting master of the ship, which he said was intended as a sort of certificate of the good assistance Mr. Collinson had given in making the observations, and of his opinion of him generally. Captain F. had also written to Admiral Sir B. Martin, thanking him for getting R. C. appointed to the ship. R. C., however, hesitated about accepting the offer, flattering as it was; in those days the masters of ships were still the descendants of the ancient navigators, who managed all the technical details of the vessel, and were distinct from the fighting organisation; and the young midshipman would not give up his position, even temporarily, in that organisation, until he was assured it would not be affected.

## CHAPTER IV.

### H.M. Steamers Ætna, Medea, and Sulphur.

### 1831–1839.

### *Ætna and Medea.*

Immediately on touching England he began to agitate about his promotion, or rather commission; for a midshipman was not a commissioned officer then, but was liable to be turned adrift at any moment; and a commission was not so much a matter of examination as of interest. He thought he had some claim, from having been made acting-lieutenant of the ship after Captain Forster's death; and he had gained the compliments of the inspecting Commodore on the good condition of the ship on paying off at Woolwich. He had also special commendations from his late captain. Admiral Sir B. Martin (then in the Admiralty) writes, "Another highly satisfactory report of young Collinson. He is described as one of the most promising young men in the service, skilful as a seaman, and as a navigator—both quite of first-rate order; and Lieutenant Randall speaks of the exemplary conduct of the young man as the admiration of all on board. How delightful to his family to have the prospect of seeing him rise to the highest distinction in our service."

And his good friend Lieutenant Austin, writing as commander of the ship, says, "Captain Forster, in the warm attachment he had to you, told me on several occasions that he should take the deepest interest in your promotion—being, as you were, constantly with him whenever he was engaged in a series of observations, thereby secured to you the appro-

bation and friendship of your lamented captain, and the accuracy of the observations in which you assisted cannot fail to be highly useful."

He had, however, like many others then, to chew the bitter cud of disappointed hope for four years more. But he had some reward for his exertions to do his duty, in an immediate application for his services from another surveying officer, Captain E. Belcher, with whom in subsequent years he was to have very disagreeable relations. And he also had made a good friend at the Admiralty, who became greatly attached to him, and supported him very effectively from that time till the end of his active service; this was Captain Francis Beaufort, lately appointed Hydrographer, a situation which he held with much benefit to that branch of the Naval Service, and with great honour to himself, for twenty-five years.

He joined the surveying vessel *Ætna*, under Captain Belcher, November 10th, 1831, and remained in her during her whole surveying cruise, on the west coast of Africa, and on the coast of Spain and Portugal (where the contest between Dom Pedro and Dom Miguel was still going on), and also in the Mediterranean; and was finally paid off in her at Portsmouth in September, 1833.

It is remarkable (considering subsequent differences) that throughout those three years Captain Belcher was exceedingly friendly and considerate towards him; so much so that R. C. writes, "It is a pleasure to go with Belcher—the most indefatigable person I ever met—only one fault, he is his own trumpeter." "I am much obliged to Captain B. for his handsome acknowledgment of my services; I have always received such treatment that I could not do other than exert myself." "Captain B. so kind and considerate." And Captain Belcher himself writes to the Hydrographic Office, "Mr. Collinson is the best officer in the ship." But towards the end of the cruise there came a disenchantment; for, notwithstanding all these friendly assurances, Richard Collinson was passed over twice, on vacancies occurring in the Assistant-Surveyorship, although he had

virtually been doing the work of the office. On the second occasion, he consoled himself by the fortunate recipient being his friend and messmate Henry Kellett, with whom he now began that close alliance, both private and professional, which endured without a break until the death of Kellett in 1875. During all his other active services, these two were ordained by the genial fates to run in company, and support each other; the vivacious Irishman giving the life and spirit to the enterprise whatever it was, and the more sedate North Briton supplying the perseverance and the thoughtful care. In a memoir of Kellett's services, Richard Collinson writes, "Fond of his profession, a first-rate sailor, a good surveyor, he delighted in hard work; and when work was done was foremost in play."

His character was now so well established in the Navy that he was not allowed even to visit his home, on leaving the *Ætna;* he was seized upon immediately by his old "*Chanty*" friend, now Captain Austin, to join him in what was then a curious novelty in the Navy, a war steam vessel, the *Salamander.* He joined her in September, 1833, and "she sailed—I beg her pardon, steamed" off to the Tagus soon after, as part of the escort to the young Queen of Portugal, Dona Maria. After a few months Captain Austin, and a good part of his officers and crew with him, including Richard Collinson, were transferred to another and still finer specimen of the new craft—the *Medea,* just launched. The midshipman, as he still was, seems to have taken kindly to the new invention, after getting over the sailor's objection to being in a "smoke-jack," and "little better than a stoker"; but he never mastered the theory of the steam-engine sufficiently to fully enter into the new power thus given to all sea craft. Nobody indeed in those days realised that a total change in naval warfare had been thereby inaugurated. The *Medea* was a very fine war-boat for her day, and carried heavy guns of the time, and was, moreover (what all her successors have not succeeded in imitating), a good sea-boat, and a fast one; 10 days 5 hours from Plymouth to Malta, not a bad passage even in these days; but she was a paddle-boat, which is a

more effective mode of applying steam-power to propel a vessel through the water than the screw. It was also the pride of her captain, and apparently of all in the ship, to show to the rest of the Fleet that, notwithstanding the obnoxious funnel, a steamer could be kept as clean and trim as any other man-of-war. She joined the squadron (two three-deckers and four other liners) in Vourla Bay (Gulf of Smyrna), where they were then making one of those periodical demonstrations about the Eastern question, which come round as surely as good and bad seasons. Here the *Medea* was an object of curiosity and admiration, both to the Fleet and to the people of the country.

During these four years since he left the *Chanticleer* he had never ceased negotiating about getting his commission, through all the professional and private interest he could raise—both of which were very good even in that day. This delay in promoting an officer so well recommended as he was may perhaps be a comfort to some young officers despairing of success in the service they have adopted, and his assiduity in not allowing his name to be forgotten may be an encouragement to them to persevere. After ten years' service he says, "I have never (saving and except the first month) regretted for one moment" (entering the Navy); but "I would not give a farthing for a fellow that could not say a good word for himself occasionally." And to those who feel that their inventive genius has been unwisely snubbed, the following anecdote may be a salve: "Biddlecombe made some improvement in water tanks, and sent it [to head-quarters], and received answer that he need not trouble his head any further about the matter. When he went to pass, Admiral Dundas, overhauling his logs, saw this; so he said, 'Why did you not present it to the Board?' On his reply that he had done so and received such an answer, an inquiry was made, and it was found that one of the clerks had taken on himself to pronounce judgment, for which I am happy to say he got a good wigging."

In April, 1835, the long-looked-for day arrived. "How the last week has passed I cannot tell—I can say there are very

few happier. The only alloy I have is leaving my old shipmates." (There were several "*Chantys*" on board the *Medea*, particularly his dear friend Lieutenant Williams.) The young lieutenant left immediately, and found his way home through Italy.

His qualifications in the service as a nautical surveyor were now fairly established; and being twenty-four years old, his personal character was pretty well formed. He had developed that self-reliance and capacity to hold his own, trusting to his own judgment, which came out more strongly afterwards, and which seems a necessary part of the character of any man who wishes to succeed as commander in a naval service. These qualities, combined with a strict notion about doing his duty, gave him a reserve and a quickness and severity of decision, really contrary to his inner nature, which, as his letters show, and as his private conduct always displayed, was of an affectionate and very generous disposition. His letters now have somewhat formal expressions, indicating an absence of imagination and of facility of expression, curiously contrasting to the next in the family, a sister, who, with some of his characteristics, had a considerable faculty of writing with a lively imagination.

## *H.M.S. Sulphur.*

In the autumn of 1835, two vessels—the *Sulphur*, of 380 tons and 109 men, and the *Starling*, of 110 tons—were fitted out for a surveying expedition to the Pacific. They were to determine the longitude of Rio de Janeiro, which we have seen had been tried by the *Chanticleer*, but apparently not satisfactorily, notwithstanding the twenty chronometers; and to survey the west coast of America from Cape Horn up to Mount St. Elias, in lat. 60° N.; and to make a variety of observations, magnetic, meteorological, and oceanic; and even to make borings in the Coral Islands to ascertain the substratum.

Captain Beechey had the command of the expedition: a man of great reputation as a scientific voyager. But a scien-

tific man is not generally the best person to command a naval expedition even of a scientific character; that position requires a qualification for ruling men, and for practical seamanship, which such men are not likely to possess. And Captain Beechey was in bad health when he started, and had to return home in the summer of 1836. He was, however, very kind to the young Lieutenant Collinson. When that officer, radiant with joy at having at length secured his commission, arrived in England in the summer of 1835, his fast friend, Captain Beaufort (the Hydrographer), received him very warmly, having, no doubt, been mainly instrumental in procuring that prize: "Go home now and see your friends, and when you want employment, write to me."

And so we find him in December installed on board the *Sulphur* at Portsmouth as third lieutenant and assistant surveyor, a post coveted by young surveyors, not only for the honour, but for the solid addition of five or ten shillings a day to their pay; this also the lieutenant appears to have owed to the representations of Captain Beaufort. A good part of his pleasure in joining this expedition on such an agreeable footing was that the consort, the *Starling*, was commanded by Lieutenant Kellett, a happy coincidence of which we shall hear a good deal more when we come to the China War. The fitting up for the first time of a lieutenant's cabin was an important event in the home circle, where there were a good many fair fingers eager to work for it. At the head of these was the mother, who had a quite marvellous faculty of divining what her sons would be most likely to want in any expedition they happened to be starting on. R. Collinson on this occasion thanks her for various useful things which he had intended to buy,—"You think of everything that I can possibly want."

In accepting the appointment of assistant surveyor, he was much troubled about his own capabilities for the post, and anxious to impress on Captain Beechey his deficiencies as a draughtsman; and he contemplates rather despairingly his first serious attempts at "chart-building."

The expedition sailed in December, 1835, and in passing

down the Atlantic followed much the same track as the *Chanticleer* in 1828. On arriving at the west coast of South America, he found his old friends "the Patriots" had not profited much by the independence they had been so anxious to obtain. Excepting the Chilians, who had already shown the signs of vitality which have subsequently made them so prosperous, he observes that the half-castes, who constituted the bulk of the population, appeared to be in a state of demoralisation, showing an indolent apathy to any advance in civilisation, and a want of energy to make use of the extraordinary rich productions of the country. The ultimate fate of such a population is still a subject for serious inquiry by the politicians of the civilised world.

In March, 1837, Captain E. Belcher (late of the *Ætna*) joined the *Sulphur*, having been sent out to Panama to take the place of Captain Beechey. During the interregnum, Lieutenant Kellett had acted as commander, and Collinson as first lieutenant, as well as assistant surveyor; which two offices he continued to hold under Captain Belcher, adding thereby greatly to his labours, and much to his subsequent troubles. From previous circumstances the appointment of Captain Belcher caused some trepidation to the first lieutenant, as well as to others; but the new commander behaved with the "greatest possible cordiality,"—"No doubt the best man we have,"—and all seemed prosperous under so able a head. We have the account of the rest of the work done by the *Sulphur* from the captain's own hand, published in 1843, on his return home from China.

In this account, the variety and interesting nature of the notes and observations recorded are to a great extent spoilt by the looseness of the expressions, and the frequent intrusion of the commander's own personal doings: blowing that trumpet the lieutenant complained of before. They tried the experiment made by Captain Forster of determining differences of longitude at the Isthmus of Panama, by the simultaneous observation of rockets or explosions of powder; but Captain Belcher came to the conclusion that "pocket watches, carefully rated, are more trustworthy than rockets."

The electric telegraph has now superseded all such observations. During the autumn of 1837 they coasted up North America to Mount St. Elias, which the lieutenant calls "the paragon of mountains—Vancouver's description of it, that the Rocky Mountains form a base from which it rises, is peculiarly correct." As it is a volcanic cone rising in solitary grandeur from the sea-coast to an altitude of 20,000 feet, we can appreciate this admiration. Captain Belcher mentions the strata of ice and mud in the coast cliffs, and the finding of "dirty" ice on high ridges of the mountain.*

The British possessions (according to the assistant surveyor) then extended from San Francisco to Mount St. Elias. No doubt at one time they might have done so, and would still if British statesmen in accesses of weak generosity had not given away what really was not theirs to give. He also mentions the ever-hospitable Russian settlement of Sitka, of which he was long after to experience the liberality, and the even then superb character of their establishments; all of which have now passed into the hands of the United States. At San Francisco Harbour they surveyed the whole of that great estuary, and the assistant surveyor says with pride that he trusts he has so fixed its longitude by moon and stars, that it will be for ever after considered as a geographical milestone: a British legacy which it is to be hoped the great Western Republic appreciate. He expatiates on the immense advantages of the climate and country for the immigration of a white race, and anticipates (by fifteen years only) the location of a million of inhabitants in it.

After this troubles began. Captain Belcher, with all his talents and energy, had some serious failings as a commander; he was decidedly egotistical, and his good opinion of himself made him rather overbearing to those under him; and he appears to have had some weakness which made him captious and excitable, and led him into frequent troubles with his officers. Something not recorded must have occurred between him and Lieutenant Collinson which roused these ill-feelings,

* An interesting account of this mountain will be found in the *Alpine Journal* for August 1889.

and induced him to begin a treatment which at last became so unbearable that the lieutenant demanded a court martial for the defence of his honour. The Admiral of the Station desired to effect some satisfactory settlement of the case without having to appeal to that public tribunal, but the young lieutenant felt that the character he had earned during his fifteen years' service, for strict devotion to duty would be sacrificed if he consented to any sort of compromise; so he was taken out of the *Sulphur*, and kept on board the flagship, waiting a passage home, in order that the case might be decided by the authorities in England. For some reason not explained in the records, he remained a whole year on board the flagship on the station, during which the favour shown to him by every one from the Admiral downwards was a fair evidence of the opinion on his case. This absolute loss of a whole year's work was a great additional sorrow, but it turned out to be a fortunate detention.

He did not arrive in England till November, 1839; but he immediately set to work to consult his professional friends as to the course he should pursue to vindicate himself. The general recommendation was to trust to his well-known character in the service. Captain Beechey wrote, "I do not think any testimonial of character can improve the high estimation in which he is held by all who know him. All speak of him with the highest encomiums of his amiable disposition and of his upright conduct." But no doubt Captain Beaufort and Captain Austin and other influential friends had been exerting themselves more decisively in his favour, for there is no record, public or private, of any decision at all in the matter by the Admiralty; and within a month of his return he received an offer from Captain Beaufort to go out to the Chinese War Expedition, which was then commencing, as Surveying Officer to the Fleet. This was a highly honourable and very responsible post, the more so from being something new in naval warfare; being considered as specially required on this occasion owing to the peculiar character of the operations expected.

This offer naturally reinstated him in his own good

opinion, as it was felt to be a complete answer to all charges against him. On the 18th of February, 1840, having been only two months at home, after all his troubles and anxieties, he joined H.M.S. *Blenheim* at Portsmouth, in which he was to have a passage out to China, and busied himself in collecting and testing the various instruments he required for his new duties. And it so happened that two years after leaving the *Sulphur* at Valparaiso, he met her again at Canton, but in an independent position, and in some measure on an equality with his late commander.

## CHAPTER V.

### THE FIRST CHINESE WAR AND SURVEY.

### 1840–46.

### PREAMBLE 1838–9.

THE first of our several attacks upon China was popularly known at the time as the "opium war," from its having originated by the action of the Chinese Government in endeavouring to stop the traffic of that article in their country. Opium is no doubt a very deleterious drug to be indulged in, worse in its consequences than even the consumption of spirits in this country; and many good people in England from that time to the present have been indignant that the traffic in it should be encouraged in any way, or even permitted by our Government. But, notwithstanding all the endeavours of the Chinese Government to control it, it is still indulged in to an enormous extent in China; and is even now produced in China itself in large quantities.

About the time of our first war with China, these endeavours took the forms of legalising it and prohibiting it alternately; but whatever the form, opium continued to come in, because, as in the case of French brandy in the old smuggling days, all parties, high and low, official and private, connived at the traffic. And when smuggling was the order of the day, it was perhaps the most lucrative and splendidly organised business that ever defied the law. The opium clippers, bringing the drug from India to the coasts of China, were the fastest and best-found ships afloat, quite war-ships in equipment and armament. The

present writer once witnessed the process of the smuggling operation in one of the many little harbours of that coast. As soon as darkness covered the waters, a large long boat rowed swiftly by some thirty men appeared alongside, and the crew jumped on deck. The Chinese purchasers made at once for the captain's cabin, and brought out their money, for prepayment was the rule, all taken by weight, gold and silver, of all countries, shapes and sizes; meantime the crew had been packing the balls of opium (about the size of cricket balls) in sashes round their waists; and in a few minutes all were in their boat again, and it disappeared swiftly in the darkness, to land on some desolate spot and scatter the precious balls all over the country; and before daylight the yacht-like clipper had disappeared also.

During that period Canton was the only port at which foreigners were permitted to trade; and though the foreign merchants were allowed to live under the walls of the city, they could only carry on their business through a certain company of Chinese dealers, called *The Hong*, or establishment for trade; and the foreign vessels were obliged to anchor in the river some forty miles below the town, in a channel called *Whampoa*. The Chinese authorities treated the foreigners in the high-handed and supercilious manner characteristic of the people, more marked of late years, since the monoply of the East India Company for trade had been abolished: for that great body had been looked upon in the East with respect, as being a government of some sort, incomprehensible indeed to Eastern ideas, as it was invisible to Eastern eyes, but possessed of the essentials of government, soldiers and ships. A captain in the Company's merchant service continued to trade in an old Company's ship, after the trade was free, as a private adventure; when he first appeared in the Canton River in this more humble form, the Chinese pilot addressed him in the familiar lingo of his tribe: "Hi ya! you Cappen Tom! you come before time Company ship—what for you now come common ship, d—— you eye?"

This habitual tone of superiority was fostered by the status of the only representative of British authority then in China, who had inherited the old Company title of "Superintendent of Trade," a concern beneath the dignity of a mandarin of any standing, however much he might personally profit by it.

By the year 1839 the demands of the Chinese authorities with respect to the opium trade had reached such a pitch, that all other trade with the English was summarily stopped, some opium vessels were arbitrarily seized and confiscated, British subjects were imprisoned, and a demand made for the delivery to the Chinese authorities of all the opium then lying in the Canton River. It was at this period of the affair that the British Government showed their habitual want of appreciation of the matter at issue; and the hesitation that ensued was increased by the conduct of the operations being placed in the hands of the Indian Government, who still were considered "Primus in Oriente." The then Superintendent of Trade, Captain Elliott, R.N., not being prepared to fight the Chinese Empire, and being naturally of a peace-desiring disposition, endeavoured to temporise: a game at which he was no match for one of the most astute as well as the most ancient of Eastern powers. The Chinese authorities took a high hand, fortified the narrow parts of the river, blocked it by booms, prepared their war junks, boats, fire rafts, &c., and generally defied the British Government; whilst in the meantime more than 20,000 chests of opium, valued at £2,000,000, were delivered up to them, and, to the honour of the mandarins, were actually destroyed.

The Chinese Government was still at that time indulging in the traditions handed down from centuries of power and civilization, of their unique and superior position in the world. The conquest of China by the kindred race of Manchus had no doubt added to this feeling, by introducing the more military tone of that powerful people; but it had also introduced an element of weakness. Notwithstanding the two centuries of domination, the Tatar conquerors everywhere in China were still the foreign rulers, and their authority in each great city was supported by a garrison of

Tatar troops occupying a distinct enclosure or sort of citadel. The Chinese proper are a peaceful race, obedient and industrious, but most material in their ideas and without spirituality: they have no inherent objection to live in amity and commerce with other peoples, being social and good-humoured, and were on the whole perhaps more ready to assist the English than their own Government; they got better pay for doing so, which goes a long way with a Chinaman. Thus, there were two parties in the country, as concerned these dealings with the English; and the Imperial Court, being, in its far-distant capital, entirely ignorant of the real state of affairs at Canton, was influenced sometimes by the peace party and sometimes by the war party.

A strong show of British naval and military power in 1838 or 1839, in one of the northern ports, conveying a determination to establish an equitable intercourse, and at the same time to be just and peaceful, would, judging by subsequent events, have saved much of the war operations, not only of that time but of the still more extensive ones on subsequent occasions.

The first person apparently to perceive the full conditions of the affair was the then Prime Minister, Lord Palmerston; it was due to his initiative that in 1840 a considerable naval and military expedition was prepared both from England and from India to act on the northern coast of China. And it was not only the extent of the operations required, but the peculiar character of them jointly naval and military, that had to be considered. The coast of China is intersected by a succession of harbours and outlying islands, and by large navigable rivers having broad embouchures; the soil brought down by these numerous rivers appears to have been, during past ages, filling up the sea and connecting the islands into one expanse of level country, which for the most part is now highly cultivated and studded with populous towns carrying on an extensive inland traffic; and the many natural water channels have led the people to use this valuable means of communication to a great extent. The Grand Canal of China is a highway of traffic extending from north to south

over the alluvial plain near the coast, and the intersections of this highway with the navigable rivers afford an access to it for sea-going ships. Hence the idea arose, on the suggestion of Lord Colchester (who had visited the country in Lord Amherst's Embassy), of entering the great river, the *Yang-tse-kiang*, with a naval force, and occupying the towns at the points where the canal meets it, as a means of producing an impression of British power on both the Government and the people; and in the end the execution of this idea did produce the desired effect, though only after considerable expenditure in men and means, in attacking and occupying other places of less importance.

The conditions, therefore, of the country offered an unusually favourable opportunity for displaying the peculiar power of Great Britain in the use of joint naval and military operations. The British Government were enabled to assemble in a few months, from England, from the Cape, from India, and from Ceylon, a considerable force of ships and troops: this force, as the resistance of the Chinese was found to be more determined than was expected, was gradually increased, until at the final advance up the *Yang-tse-kiang* it amounted to 20 war-ships (10 of which were line-of-battle), and 9000 land troops (English and Indian), carried in 45 transports. With this Armada they moved from point to point along the coast, virtually carrying their base along with them, appearing suddenly in front of a city, bombarding and assaulting it, afterwards occupying some secure position near it, then moving the main body on to another port and repeating the operation. To the Chinese the appearance of such a force must have been like the advance of the Turcoman hordes upon the refined civilization of the Byzantine Empire, or the invasion of the Roman territory by Theodoric; with this difference, that the Chinese soon found that the enemy they had to deal with was not only much more powerful in war than themselves, but exercised a humanity and consideration unusual in the East. The military power of the Chinese Empire was then virtually defunct; though every city, and indeed almost every village, was enclosed in a

well-built wall, and there were large numbers of trained soldiers, with matchlocks and good cannon, besides bows and spears; and though they made most strenuous efforts in preparations by sea and land, and in some cases showed a courageous devotion, they had been for so long unaccustomed to meet a powerful enemy, that the resistance was seldom prolonged.

It is evident, therefore, that this character of warfare offered a very favourable opening to the newly-created Surveyor to the Fleet. He was to be the pioneer of the expedition, to sound and mark the way for the great ships up the channels, and therefore to be in the forefront of every operation. It was an unfortunate, but a characteristic defect in the British arrangements, that no special provision had been made for the peculiar duties of the expedition. As long as the troops were in the transports, they were under the care of the Navy; they could not even land without naval permission, but on the other hand when landed they were left to their own resources in an unknown country, and were to a great extent cut off from the base of their supplies. The operations suffered accordingly, and indeed in this matter, of the defect of a proper provision for the connection between the troops and transports in this kind of joint operation, there still remains much to be desired. And in the case of the Chief Pilot of the Fleet, instead of providing him and his colleagues with small fast steamers, it was only after the first year that he had any vessel under his own command; and that was only a sailing brig of some 200 tons, which had been a pilot boat in the Hooghly, and was therefore built to ride and not to sail. Happily for the war pilots the Chinese, among their peculiar ideas of warfare, considered it right to reserve their fire until they were fired upon, and thus the pioneers were generally able to pursue their reconnaissances without opposition from the enemy.

## CHUSAN—PEIHO—CANTON—1840–41.

In June, 1840, the main body of the expedition arrived at the Portuguese settlement of Macao, situated at the entrance

of the Canton River on the south-west side; it consisted of 6 war vessels, 4 steamers, and 22 transports, containing 3 English and 1 Indian regiment, with artillery and engineers, in all about 4000 troops. They sailed north immediately to carry out Lord Palmerston's idea of occuping some place of importance; and the place selected was the island of *Chusan*, which lies close to the mainland, about 900 miles N. of the Canton River; a not very happy choice, as it turned out, being too outlying a position to produce the desired effect on the Imperial Government, and too large to be a desirable permanent possession. The Chinese were not prepared for this sudden move, and made but little defence; the real difficulties began after taking possession, for the town taken was deserted by the Chinese, and difficulties arose about getting supplies and cover for the troops.

Part of the expedition went further north in August, with the plenipotentiaries appointed by the British Government to treat with the Chinese Government, and anchored off the Peiho River, which comes from Pekin. Here they were met by *Keshen*, a mandarin of the highest rank, and member of the Imperial Cabinet, and who is described as one of the most enlightened and reasonable officials of all those whom the British had to deal with. But with the weakness of an effete government, the great object of Chinese diplomacy was to persuade the invaders to go away from the neighbourhood of the Court; and they succeeded, on the plea that the proper place to discuss the complaint of the British was at Canton, where the injury occurred. So by the end of 1840 we find the expedition concentrated in the Canton River again, excepting the force left in possession of Chusan, which, after considerable sickness and suffering, was now well supplied by the Chinese. The Surveyor of the Fleet had arrived at Chusan in the *Blenheim* in July, after its occupation, and was employed during the winter in making a survey of that little archipelago of islands.

In the spring of 1841 the war party had got the ascendency at Pekin. The appearance of the British force on the north

coast had disturbed the calm created by the report of the Viceroy at Canton, which was to the effect that the barbarians had been quashed in that province; and accordingly that official, in compliance with Chinese custom, was made to suffer for his error by being degraded. The point and terseness of the sentence of degradation (which was found among the official papers at Canton) is worthy of Thomas Carlyle: "You have caused the waves of confusion to arise, and a thousand interminable disorders are sprouting; in fact, you have been as if your hands were tied, without knowing what to do: it appears that you are no better than a wooden image." The waves of confusion having broken on the shores of the *Peiho*, the war party determined to put at Canton something better than a wooden image. But the proceedings of these new and more war-like authorities in delaying the settlement of the affair, while they were strengthening the defences of Canton and massing large bodies of troops in its neighbourhood, at last compelled the peaceable English plenipotentiaries to resort again to strong measures.

Canton is about 70 miles up the river from Macao; the river below the city is broken into several channels; the principal one is 15 miles wide at the mouth, but about halfway up narrows at once to a channel 1½ to 2 miles wide, and some miles long, with small islands in it, the ground rising abruptly in small hills. This passage was named by the Portuguese "Bocca Tigris," cut down in Anglo-Chinese lingo to "The Bogue." Here the Chinese had always had forts, which they now strengthened and armed and manned. In January, 1841, a British force of 7 war-ships and 2 steamers, with 1400 men, went up the river and attacked and took the outermost of these forts, the Chinese troops making a fair defence under the circumstances. Upon this their authorities began to treat immediately; but of this treaty the only two articles that were eventually carried out, were the evacuation of *Chusan* by the British, and the surrender of the island of Hong Kong to Great Britain. The evacuation of *Chusan* gave encouragement to the war party, and Canton was further strengthened; the remaining Bogue forts had 340 guns alto-

gether mounted in them, and barriers of rafts and chain cables were stretched across the principal channel.

In January two other surveying vessels appeared in the Canton River, the *Sulphur* and the *Starling*, from which Lieut. Collinson had parted two years before on the W. coast of America; these, on their way home by China, had fallen into the stream of the war, and were immediately set to work to discover some channel by which the large vessels could get up to Canton; for it was till then supposed to be impracticable. Kellett, in the *Starling*, found a passage at the Bogue forts practicable for battle-ships, which the Chinese had omitted to block up; and on February 25th ten war-ships passed up by it, and the whole of the forts were taken. The *Sulphur* then piloted the war-ships up to the reach at the lower end of the city.

Again the negotiations for treaty began, and again led to nothing but procrastination and a further increase to the defences of the city; it was therefore determined that Canton itself should be taken. About this time Lieut. Collinson arrived from Chusan, and took part at once in the reconnaissances which were now made of the channels leading to the city. By a happy chance he never met Captain Belcher, but he was frequently with Kellett in the *Starling*.

Canton lies almost entirely on the north side of the river; it is a walled city, and on the N.W. side of it, beyond the walls, are some eminences overlooking the town. From the upper end of the town a separate channel of the river led direct down to Macao, and as this was supposed to be impassable for war-ships, it was not strongly fortified. It was therefore resolved to send a large body of troops in the vessels of lighter draught by this channel to land above the town and seize those heights; while the larger war-vessels, with other troops, forced their way up the main channel and landed at the foreign factories (which were at the lower end of the town and had been sacked by the Chinese mob). Kellett and Collinson explored this Macao passage in the *Starling*, and met with little opposition. On sending a warning to one fort, "about two hours after an interpreter

came alongside to say that if we attacked the fort it was the intention of the Mandarin not to fire 'plums' (*i.e.* shot), but that he hoped we would not come on too hot, because they wished to remove their traps." Kellett's account of this was that the messenger said: "He Number one Mandalee say supposee you no put plum in gun he no puttee plum in —he makee facee fire—then go way." And that his reply was: "Tell the Mandarin he is a gentleman, and we shall be happy to see him to breakfast." Captain Belcher, in the *Sulphur*, explored the upper part of the Macao passage right up to the city, and selected the place of landing for the troops. In the course of one of the numerous engagements during April, Lieut. Collinson with his supporting force got up to the city, "and found the Plenipo' with a flag of truce up as usual. It appears to me a most strange policy that the victorious party should not compel the vanquished to hoist the white flag first."

There was good evidence that the people of the place were not on the side of their Government. "In chasing a mandarin boat, the inhabitants readily pointed out the way she had gone, and heartily cheered our men when she was captured." The Viceroy *Keshen* reported to the Emperor that the Chinese at Canton would not assist against the English.

On the 24th May (Her Majesty's birthday was saluted as usual to give notice to the Chinese that they were coming) the attack was made, and by nightfall the northern heights and the foreign factories were both in possession of the troops. Captain Belcher piloted the northern division, and Collinson that up the main channel. Fourteen fire-rafts were sent down upon the division in the main channel, some chained together, so as to catch across the bows of a vessel, but they were all pulled clear of the ships by the boats; forty-five junks were destroyed; there were some intricate channels to get through under fire, and massive obstacles in the river, lines of bamboo caissons filled with stones, and also junks sunk; "we destroyed sixty-four cannon, three of 10½ inches bore and 13 feet long." But the Chinese made little resistance when the war-ships came near. Next

morning considerable trouble and danger to the British force was occasioned by the procrastination between the Chinese authorities and the "Plenipo'" in coming to a distinct settlement; this delay, as the British troops were only about 2200, and the Chinese were 20,000, was an anxious time to the commanders. A final agreement was at last come to, and, under the pressure of the unanswerable shot and shell, was carried out this time in full. The Chinese paid an indemnity of £1,200,000, besides the value of the injury done to the factories, trade was reopened on fair terms, and Hong Kong became a British possession. Among the promotions given for this success at Canton, Lieutenants Kellett and Collinson were made Commanders.

## AMOY—CHUSAN—NINGPO—1841.

The British Government had by this time realised that this Chinese affair was of larger importance than a mere settlement of trade at Canton: that it was, in fact, the beginning of a new epoch in the relations between China and the rest of the world; and they had determined to persevere in the operations until the Chinese Government recognised that there was at least one foreign power with whom it was to their interest to be on terms of friendly equality. They had, therefore, sent out reinforcements of troops and ships, and what was of equal importance, a new plenipotentiary, the well-known Indian officer, Sir H. Pottinger, a new admiral, that fine seaman Sir W. Parker, and a new general, the gallant Sir H. Gough; the latter, indeed, arrived in time to command at the capture of Canton.

In August, 1841, the whole available force of troops and ships, leaving only a garrison for Hong Kong and a guard for the Canton River, proceeded northward. There were three divisions of ships:—

| | War-ships. | Transports. |
|---|---|---|
| No. 1 Division . . . | 3 | . . 7 under a War-ship. |
| „ 2 „ . . . | 3 | . . 6 „ „ |
| „ 3 „ . . . | 3 Steamers | . . 8 „ „ |

and on board were the 18th, 26th, 49th, and 55th British regiments, with artillery and engineers, and a company of

the 36th Madras Native Infantry; altogether about 2700 men. The first place attacked was *Amoy*, a large seaport on an island in an estuary about 300 miles north of Canton. Here the Chinese had made considerable preparations: mainly a long battery near the entrance, built of granite, with casemated embrasures, and with a bank of earth against the face, and mounting ninety-six guns. The Surveyor of the Fleet was now in his own little vessel, the Hooghly pilot boat, then called the *Bentinck*, which "he hopes to make worthy of her name"; and to complete his satisfaction Kellett was with the expedition in the *Starling*, the *Sulphur* having gone home from Canton. Admiral Parker, in his despatch reporting this affair, says, "The *Bentinck* was appointed to sound the channel ahead of the *Wellesley* (and had therefore to pass along the above battery), which Lieutenant Collinson skilfully performed, and then gallantly anchored the brig within the entrance of the harbour." In two hours the Chinese batteries were silenced, for, in fact, with all their care and energy, they were unable to traverse their guns, and so could only fire usefully when a ship came directly in front of the guns. The small island of *Koolongso* opposite the town was taken possession of, and a guard of troops and ships left there, which was retained for some years, until the full completion of the final treaty.

In September, 1841, the island of *Chusan* was retaken. Here again the Chinese had made extraordinary additions to the defences since it was abandoned by the British in February. Batteries mounting 200 guns had been erected, and the harbour was quite blocked against the entrance of ships. But they had not calculated on the landing of troops and guns outside the harbour, by which manœuvre positions were occupied by the British force commanding the defences; and thus taken in flank, the Chinese troops, an irregular sort of force, soon disappeared from the scene altogether, and the place was reoccupied, and retained until the full completion of the final treaty. The surveys of Lieutenant Collinson came into good use on this re-occupation, copies of it being distributed to the fleet.

In October the main body of the expedition proceeded to *Ningpo*, a town of 600,000 inhabitants, on the mainland opposite *Chusan*, and a few miles up a navigable river. The entrance to the river (*Chinhae*) was well fortified on favourable heights, and the river was piled, and defended by war-junks and gunboats; some 14,000 Chinese troops, and 150 guns, both brass and iron, made in the place, after English patterns. The ascent of this river gave good opportunities to the *Bentinck*. Admiral Parker says, "*Bentinck* has rendered much valuable service in surveying. Commander Collinson's exertions are unremitting; he is daily adding valuable information." And an equally gratifying recognition came from the Hydrographic Office in the increase of his surveying pay from 5*s*. to 20*s*. a day. After the capture of this place there was a lull in the operations during the winter; but the surveyors were hard at work exploring the coast and channels preparatory to an advance up the *Yang-tse-kiang*. In the course of this service they had some skirmishes with the enemy: the *Bentinck* went up the *Ningpo* River some 20 miles, in company with a small force, and unexpectedly captured a town; "by the spirited conduct shown by Captain Bourchier and Commanders Watson and Collinson," says the Admiral.

In March, 1842, the Chinese commanders, conceiving by the inaction of the invaders that they were downhearted, made an attack on *Ningpo*, and actually got into the city, but paid very dearly for it, by meeting the fire of the artillery in the narrow streets; this stopped any further attempts. The Surveyor was sent with the *Phlegethon* steamer and the *Bentinck* to explore a river 30 miles from *Ningpo*, and which leads from the town of *Chapu* to the capital of the province *Hangchou;* but he found the tide too strong in it (11½ miles an hour), and the water too shallow for naval operations. Having heard of his promotion, he writes, "I am now wedded to this expedition—never had a person such an opportunity of acquiring honour, and rendering himself useful."—"We had a most beautiful sight the night before last; no less than 70 fire-rafts, all on fire, came down the river

(*Ningpo*). They were boats filled with straw, among which rosin had been strewed and oil, with a couple of boxes of powder."—"I hope we shall have the means to fly at higher game, and that it will not be necessary to carry ruin and devastation into more places than can be avoided." The commanders of the expedition were waiting for reinforcements, with a view to the taking of *Nanking*. But in May, 1842, it was determined to take the town of *Chapu*. This was the first occasion on which the expedition came in contact with the real Tatar troops of the Empire, and the records agree as to the superior quality of them, and their desperate determination to die at their posts; they killed themselves (and their families) rather than fall into our hands. As *Chapu* was immediately evacuated again, the Surveyor says, "I cannot justify the attack, which without some ulterior object must certainly have somewhat of the buccaneer about it." But this affair brought credit to him and his friend and colleague Kellett. In the Admiral's despatch on the affair he says, "Commanders Kellett and Collinson have been indefatigable in surveying every part we have had to navigate; they succeeded in sounding out the channel during the night, thus enabling the ships to take up excellent positions." And he mentions the spirited exertions of Lieutenant Bate of the *Bentinck*, who was to be Collinson's right-hand man and trusted friend for four years afterwards.

Indeed Sir W. Parker thought so well of the Surveyors' work that he wrote a special despatch about it: "I avail myself of this occasion to express my opinion of the great advantage the expeditionary forces are constantly deriving from the zealous and able exertions of Commanders Kellett and Collinson, and the surveying officers under them; by which we are enabled to navigate the fleet and to approach the various points of attack with confidence." A good testimonial to the sagacity of the Hydrographer in providing such a branch of the undertaking.

## YANG-TSE-KIANG, 1842.

Early in June, 1842, the whole force advanced up the *Yang-tse-kiang*, upon the great objective point of the expedition. The reinforcements had now arrived, and the following very respectable naval and military body entered the mouth of this great artery; had it appeared there two years before it would probably have saved much bitter feeling many lives, and great property.

*Naval Force.*

10 Battle-ships.
5 Steam Frigates.
5 Smaller Steam Vessels.
2 Surveying Vessels.

*Military Force.*

| | | |
|---|---|---|
| 1st Brigade | . | 3½ Regiments (British and Indian). |
| 2nd „ | . . | 3 „ „ „ |
| 3rd „ | . . | 3 „ „ „ |
| Artillery | . . . | 5½ Batteries and 4 Companies (Lascars). |
| Engineers | . . . | 3 Companies (Madras). |

Conveyed in 5 Troop-ships and 40 Transports (comprising 3000 tons).

Among the reinforcements was one regiment which brought much gratification to Commander Collinson, the 98th, then under Colonel Colin Campbell (Lord Clyde); a subaltern in which was Lieutenant L. Shadwell (son of the Vice-Chancellor, and therefore almost a brother to a Collinson), and who long after wrote the life of his distinguished chief. Another subaltern was Lieutenant Wade, who afterwards by his remarkable knowledge of the Chinese and their language became Minister of Great Britain to the Court of China. There were also two Captain Edwards in the regiment, old friends and schoolfellows of the Commander.

The expedition did not go straight to *Nanking*, but stopped to attack the large seaport town of *Shanghae* at the entrance of the river on the south side. It is about fifteen miles (geographical) up a smaller river, and therefore there was the same operation as at Ningpo, of first taking *Woosung*, at the

entrance. The Chinese offered no great resistance here, apparently not having expected an attack. The difficulties were mainly for the Surveyors in getting the large fleet safely along this great estuary. "The land in the neighbourhood of the entrance (of the *Yang-tse-kiang*) is very low, and the shoals and banks extend a long distance from the shore, so there are no marks by which to avoid them. Kellett's plan therefore was to anchor vessels, so as to guide the course for the deepest water. The *Woosung* batteries were somewhat similar to those at *Amoy*, and with this difficulty, that the channel (in the *Shanghae* River) leading up to them is only two cables in width. This we sounded and buoyed during the night; and as we dropped the last buoy, which was within 400 yards of the principal fort, the Chinese gave us three cheers. I returned them many thanks for the compliment, and felt particularly obliged that they did not fire. The next morning, the wind being foul, the *Tennaserim* steamer took the *Blonde* in tow, which vessel I was ordered to conduct into position; the unfortunate *Plover* (as the *Bentinck* had now been re-named) being left outside the river as a beacon, and not allowed to earn a laurel for her new name, which new name, by-the-bye, I think a most rascally proceeding. We led in, being closely followed by the *Cornwallis* (the flag-ship), conducted by Kellett. Both vessels got into position without accident, and were followed by *Modeste, Columbine, Clio,* and *Algerine.*"

*Shanghae* was taken a few days afterwards without any resistance; part of the troops having marched by land from *Woosung.* The invaders were impressed here with the handsome appearance of the town, and the beauty of the private houses and their furniture. *Shanghae* is now one of the most important centres of foreign trade.

On July 6, 1842, the advance up the great river began. The city of *Nanking* (the capital of the ancient kings of the Ming dynasty) is about 200 miles (geographical) above *Woosung,* on the south side of the *Yang-tse-kiang;* for about half-way up that distance the river is more than five miles wide, with tortuous channels among sandbanks, then

it narrows suddenly to less than a mile, and small hills appear on the vast plain. From this up to *Chin-kiang-fu* (60 miles geographical), and thence to *Nanking* (40 miles further), the channel continues from a quarter to two miles wide, and at the latter place is 24 fathoms deep. The *Plover* and the *Starling* had to keep ahead of the expedition the whole way, sounding out the channel and placing buoys to guide the ships. The progress of this immense "Armada" was sufficient of itself to terrify the Chinese, for it must have been one of the most imposing, as it was one of the most enterprising of war preparations ever made. The ships moved in divisions with spaces of one or two miles between each division. At about 70 miles above *Woosung* the tide ceased to act, and the ships had either to wait for a fair wind or to be towed. The Surveyor says the navigation was easier than they expected, and was not interfered with to any serious extent by the Chinese, who apparently had been expecting the attack to be made at *Pekin*. By the 20th of July the whole expedition was assembled opposite *Chin-kiang-fu*. This was the real objective point of the attack, because it is here that the Grand Canal debouches on to the river from both north and south, the object of the expedition being to blockade it so as to stop this great highway of traffic.

*Chin-kiang-fu* is a very fine walled city on the south side of the river, and here the Chinese, encouraged by the presence of a body of selected Tatar troops under a general of high character, had determined to make one more effort to drive back the invaders. The whole appearance of the place, as seen afterwards, displayed wealth and refinement, combined with great order and cleanliness. In the suburbs were country houses of the citizens handsomely laid out and furnished with the most tasteful of those elaborate articles such as now come from Japan to adorn our mansions in England. In mid-channel of the river lay the two islands, called for the richness of their appearance, both natural and artificial, the Golden and Silver Islands; the surrounding country, broken by gentle hills, was so beautifully wooded that the name of Arcadia was at once given to it.

"*Kinshan*, or Golden Island, is a bijou of a place, situated in the middle of the river, and only about a quarter of a mile in extent; it rises to the height of 200 feet very abruptly, the trees springing out from every crevice that has earth sufficient for the roots. At the top is a handsome pagoda. The Emperor's palace has gone much to decay; his throne, however, is still to be seen, as also the Empress's. I regret exceedingly that the library, which was very extensive and in capital condition, was not secured before the peace, as it would have given us a valuable insight into Chinese learning. All the books were in rosewood boxes.

"There were also some magnificent books of plates pourtraying the Manchu conquest, and one with views of all the Emperor's palaces; these were packed in japanned boxes, and covered with rich yellow satin. The margins of the pages rivalled our best albums in embossed figures and elegant designs, all neatly gilded."

This magnificent scene of long ages of peace and contentment was to be stained with one more desperate act. The Chinese had posted part of their force four or five miles out of the city, and left the city itself apparently undefended, by which the invaders were led into a false security; but their force was sufficient to overcome all defence, for the British troops were 12,000 strong, including seamen and marines, and the Chinese force in the city only about 2400; the strength of their force outside is not mentioned. While one brigade went to attack the outlying force, the other two brigades, by escalading the walls or blowing open the gates, got inside. The Tatars then most gallantly endeavoured to recover it, by a desperate fight in the streets, and when all failed, killed both themselves and their families.

The capture of *Chin-kiang-fu* closed the hostilities of the war; for although the expedition ascended to *Nanking*, there was no attempt at defence, and the High Commissioners appointed by the Emperor, after some fencing off, came on board the flag-ship to make terms of peace with the British plenipotentiaries. Immediately after the taking of *Chin-kiang-fu*, the *Plover* and *Starling*, accompanied by a

steamer, went on to within sight of *Nanking*, and the two Surveyors returned in the steamer to report. The whole force got up to Nanking by the 8th of August; but it was the 20th before the Chinese Commissioners finally gave in. Once more they attempted the procrastinating and shirking game, and it was only the actual landing of troops that finally convinced them that Sir H. Pottinger was not a man to be deceived by fine speeches.

During the progress of the negotiations the British invaders had an opportunity of examining this renowned city. They were, however, on the whole disappointed; the influence and the wealth of *Nanking* had decayed, no doubt since the Imperial Court had been removed to *Pekin* on the Manchu conquest. Although the walls were of vast extent, four-fifths of the space enclosed was open ground, and the condition of almost all the ancient public buildings was dilapidated. In the suburbs outside the walls on the S.E. side were the monuments of the ancient kings, approached by an avenue of colossal stone figures of animals; one of these sacred buildings was the Hall of Ancestors, 250 by 200 feet, the roof of it being supported on wood pillars, and covered with yellow tiles, richly glazed, so as to give a golden lustre to it outside.

In the southern suburb, and not in the city as might be expected, was the renowned Porcelain Tower, which is fully described in Ouchterlony's 'Account of the War.' It was a pagoda (or sacred temple) of ten stories, and stood in the centre of an elevated quadrangle, forming a sort of pedestal to it, the whole height being (apparently) 200 feet, and the height of the tower itself 140 feet. The peculiar beauty of it consisted in its being faced both outside and in with bricks and tiles of the porcelain clay (*kaolin*) of various colours, some of which were moulded into figures and plants all properly coloured. The plan of it was octagonal, and each story had its little roof of glazed yellow tiles; the tall pointed roof crowning it was surmounted by a pine-apple richly gilt, with gold chains hanging from it. From the corners of the roofs of each story hung bells, and in each of the eight faces

was a doorway with a pointed arch. This beautiful monument of Chinese art was destroyed during the *Taeping* rebellion, in 1850–63.

On the 29th of August, 1842, the final treaty of peace was signed, and on that occasion a special meeting of the high officers on both sides with the leaders of the expedition was held on board the flag-ship, the *Cornwallis*. A picture of this meeting was painted at the time by an officer, and afterwards engraved: the two Surveyors of the Fleet, Kellett and Collinson, figure in it. The main terms of the treaty were that the Chinese Government should pay an indemnity of £4,250,000, and that five additional ports should be opened to foreign trade. This treaty was carried out; but the Chinese Government were not yet prepared to give up their old exclusiveness and their ideas of superiority. It required two more expeditions, the last one in 1858–60, in the course of which the joint forces of the French and English captured Pekin, before the Imperial Court could be brought to understand their true position in the world with respect to other nations. Since that date the Chinese have greatly expanded their ideas, and are now beginning to take their place in the general comity of civilised States. But probably the first revelation to them of the beginning of a new era in their history was the sight, by the vast population bordering the *Yang-tse-kiang*, of that long succession of huge vessels, extending over a length of probably ten miles, slowly sailing into the interior of their hitherto inviolate country.

Honours and rewards were given on the termination of the war. The two Surveyors were promoted to the rank of Post-Captain, and made Companions of the Bath. Admiral Sir W. Parker, in recommending them for this promotion, says, that "all difficulties have been overcome by the unremitting exertions of Commanders Kellett and Collinson, in advancing up 170 miles of river altogether unknown, and in which the rapid tides created unusual obstacles;" and in mentioning their claims for the other honour, he points out that they had been employed from almost the beginning of

the war in every operation, and their services had been spoken of on each occasion with the highest commendation. They were also specially mentioned in the despatches of the plenipotentiary, Sir H. Pottinger. They were promoted in December, 1842.

## The Survey of the Coast.

The *Plover* and *Starling* immediately set to work to survey the *Yang-tse-kiang* from *Nanking* to the mouth; and by the middle of November, 1842, they had completed it, and were at *Chusan:* "a work which will give more credit to Kellett and myself than all the Chinese actions that were ever fought." He had now begun to realise that there was another duty that came in his path, namely, the survey of the ports that had been opened to foreign traffic by the treaty; and that he must not think of returning home at present: "I had rather continue my labours for two years; the field is a rich one, and will establish a man's name for many a generation."—"I cannot with propriety offer to leave while there is a necessity for my services." Captain Beaufort had such a good opinion of his work as a surveyor, that he kept him there until he had finished the whole coast from Chusan to Hong Kong, which was not till the spring of 1846.

In the summer of 1843 he was at Hong Kong, preparing the charts of his winter's work for transmission home. Hong Kong in the two years of its occupation had become a flourishing British settlement: this island was no doubt selected from its being the nearest harbour on the coast of China to Singapore; but its occupation will no doubt involve some day the necessity of another and more secure harbour in the north of the Chinese dominions; for the trade is now chiefly with the northern parts of China and with Japan, and Hong Kong Harbour has the military disadvantage of being formed and commanded on one side by the mainland of China. *Chusan* is certainly too large an island for the purpose we require: the Pescadores, on the west side of Formosa, and which were suggested by Lieutenant Collinson when on his

way to China in 1840, would probably have met all the requirements of the time.

The British merchants, feeling the insecurity of the Chinese ports, had flocked to Hong Kong, and had already planted along the northern shore of the island a line of those imposing structures known over Eastern Asia as *godowns* (or goods depôts), a style of building which gave rise at that time to a new denomination in architecture. Being constructed, as everything else was done, under the superintendence of the *compradore* (or steward) of the establishment, it was fitly called the Compra Doric Order. However incongruous in style, the upper floors which formed the sumptuous and most hospitable apartments of the princely merchants were complete internally.

At this time Captain Kellett returned home; "I am sorry to part with him, and regret that I am not accompanying him home. We have been so long together, and each year has increased my regard and esteem for him." A small schooner, the *Young Hebe*, was now added to the *Plover*, and put under the command of Lieutenant Bate, an excellent officer and a good man, and the lifelong friend of Captain Collinson. He lost his life in leading the storming party at the assault of Canton in 1857.

The main work of the survey now began. Nautical surveying is carried on similarly to land surveying by triangles; only instead of measuring or calculating the sides of the triangles as the land surveyor does, the nautical surveyor lays them down at once on paper from the observed angles. Equally, however, with the land surveyor he requires that some one side of a triangle be actually measured in order to get a correct scale for his drawing. The soundings, which are so important a part of the chart, are obtained by passing in boats from one known point to another, the ships being of course one or more of these points, sounding the whole way as fast as possible; but as it is often necessary to determine the position of a point in mid waters, the surveyor, staying the boat, takes the angles with a sextant between three or four known points, which enables him to fix the

position where the boat then is, on the chart. In this way the survey is carried along a coast, and in favourable positions they remain for some days, and take astronomical observations, with a transit instrument or a large theodolite, to determine the latitude and longitude; which calculations are considered as fixing absolutely those positions, between which the rest of the survey has to be made to agree. Thus, it will be seen, nautical surveying is a more interesting work than land surveying, and offers a greater opening to the personal skill and powers of observation of an educated officer; for there is scarcely any object or natural action in the heavens, or earth, or sea, that he has not to take perpetual cognisance of. It is also evident that much more depends on the skill of the officer, and indeed it is remarkable considering the simplicity and quickness of the proceeding, and the unfavourable conditions under which it has often to be carried on, how accurate the charts are. But there is always this danger, unknown to land surveying, that notwithstanding all their care some rock or shoal may lie beneath the waters undiscovered.

In the course of this most interesting duty the surveyors had many opportunities of intercourse with the Chinese authorities and people, and they report that they found them invariably civil and well-disposed, though shy of intercourse. The captain expresses himself in his letters as greatly impressed with the order and peaceful industry and highly-civilised condition of the sea-board of the Chinese Empire. Each of the surveying vessels had a Chinaman on board as interpreter, who were persons sufficiently educated for their ordinary wants on board, and also for enabling the surveyors to obtain the Chinese names for the places, which were all marked on the original charts in Chinese characters. It speaks well for the conduct of the officers and crews of the surveying vessels, that no quarrels or troubles with the Chinese occurred during the three years' survey; a peaceable condition which was in a great measure due to the example of the captain. The chief interpreter of the forces during the war, Mr. Gutzlaff, spoke frequently to the

present editor, of the patient and forbearing behaviour of Captain Collinson, on many occasions, when he was with him in advance of the troops. On one occasion even the interpreter was roused by the perverse obstinacy of the Chinese. "Now," he said, "Captain Collinson, it is time for you to be in a rage." "We'll wait a little," said the captain.

In March, 1844, being in the River *Min* (lat. 26°), he thought it proper to call upon the Viceroy of the Province of *Fokien*, who resided at *Fuchoufu*, the capital. "I sent the *Young Hebe* up off the famous bridge at *Fuchoufu*, and as it happened to be the Chinese new year, she was gaily dressed out in flags in honour of the festival, which appeared to give great satisfaction. The myriads that were constantly cruising round her was quite ridiculous. The curiosity to see the barbarian ship brought multitudes of well-dressed ladies afloat. I found several mandarins on board, to whom I expressed my wish to pay my respects to the *Tsungtuh* * of the two provinces. They said I could not see him unless I had some business. I then said I had done the State some service in taking two pirates. . . . It ended in my saying I should present myself at the city gates on Monday morning. Accordingly on that day I landed with all the officers that could be spared; we were received by the *Taot'ai*,* and ushered through a large body of armed soldiers to a room where a feast had been prepared for us. . . . I said I had come to see the *Tsungtuh*, not to eat. We were then ushered in great state to another room, where we found His Excellency seated on a dais, chairs being provided for us. After a short interview, we took our leave. . . . The mandarins, to the number of forty, forming a line on each side of the path, bowed to the ground as we passed; the soldiers in the outer courts went down on their knees. Altogether the scene was most impressive. The mandarins were in full winter costume; the magnificence of the furs and the

* *Tsungtuh* means literally, General Superintendent, equivalent to Viceroy. *Taot'ai* means "His Excellency of the Roads," commonly called Intendent of Circuit.

gorgeous embroidery of the silks might occupy three pages of the *Court Journal.*"

In the summer of 1846 Captain Collinson was again at Hong Kong, having completed the survey of the coast from Chusan southwards to Hong Kong, including the Pescadores Islands, but not Formosa. He was now allowed to return home in the brig in which he had earned so much distinction: he sailed from the harbour by the narrow passage of the *Lyeemun;* as the *Plover* entered it, a veil of mist suddenly fell upon her like a curtain, and she disappeared; with that dramatic finale this episode in his life, the most momentous and most important, may be said to have ended. On September 24th, at Spithead, he writes: "I am greatly thankful to Almighty God for having preserved me to return home, but above all I bless Him for providing me with such a home to go to."

## CHAPTER VI.

### AT HOME.

### 1846–49 AND 1855–75.

ON his return in 1846 from the Chinese Expedition, and after he had completed the charts and reports of his surveys on the coast of China, Captain Collinson had a good long vacation; the first thorough rest since he entered the service twenty-three years before—during which he enjoyed with all the heartiness and affection of his disposition the comforts and the pleasures of the home in the little village of Boldon, lying between Newcastle and Sunderland; together with the congratulations and attentions of the numerous branches of the family and of the friends and neighbours in the two counties. It was to him, as it occurs to probably most officers in the two war services when they approach the forties, the culminating point of his active life, though not that for which he was most generally known. One of the most gratifying of the local testimonials was an entertainment given by the principal parishioners of Gateshead, the town opposite Newcastle, where Captain Collinson's father had been Rector for nearly thirty years, and where almost all the brothers and sisters had been born and brought up.

In 1847, he had a short duty on a Government Committee for examining into the local advantages of Holyhead Harbour as a national port of refuge. One of the questions to be considered in this enquiry was the quality of the bottom of the harbour as a holding ground for anchors. With his usual determination to investigate himself every matter for which he had a responsibility, he went down to look at the bottom. "I went down twice last week with the diving helmet, once

in ten and the other in seven fathoms, without experiencing much more inconvenience than if your ears had been soundly boxed, the effect of which has scarcely left me yet. Loaded with a weight of 150 lbs., I thought I should have gone plump to the bottom, but such is the difference of the gravity in and out of the water, that I literally had to force myself down the ladder. When down I could not see more than two feet, so that, instead of an inspection of the bottom, you had to form your opinion from what you felt." He received the expression "of the satisfaction of the Lords of the Admiralty at the ability and impartiality with which you have discharged the highly responsible duties assigned to you." The great breakwater at Holyhead was made, but whether it has proved to be worth the large expenditure of public money is a question probably still undecided.

For two years more he remained at home, the one son of the remaining three available for giving support and personal devotion to his father and mother, who were now beginning to enter the period when the chief pleasure of life consists in the success and in the presence of their children. And then came, in 1849, the call to take part in the search for Sir J. Franklin's missing ships, as narrated in the former part of this book.

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On returning from the Arctic Expedition in 1855, and having no inclination then to seek other employment afloat as he had been in the habit of doing, he devoted himself again to the care of his old father and mother. And now the latter began to be repaid for the brave spirit in which she gave up her son, and for her ceaseless thoughts towards him during the thirty years of his service afloat. During every one of his voyages, wherever he was, and even when he disappeared from all ken for three years in the ice, she never ceased to write to him monthly. The slight chance of his receiving all the letters, was to her of little account compared with possibility of giving him the comfort of news from home; how he appreciated it we have seen in his Arctic letters.

His father's life strength was now coming to an end, after fifty years of parish work. On the Sunday after he heard that his son who had been lost was found, as he repeated the verse, "Lord, now lettest Thou Thy servant depart in peace," his voice showed that he felt the personal application of the words. In 1857 he departed, and over his grave in the churchyard at Boldon was placed the epitaph chosen by himself, "Here lies a laborious Parish Priest." That happy home was broken up, and Captain Collinson provided for his mother and sisters a new home at Ealing, near London; which was to rival the old one in family reputation. It began with a happy omen; when the question of a name for it arose, the captain decided that the one proper designation for such a home was *The Haven;* it was not until they had settled in the house that they found the name of the little common on which it looked was Haven Green. And a Haven of refuge and rest it was from that time forth, not only to the home circle but to the whole family. So well established was it by the founder's care, that after his own departure it ceased not in its kindly functions. Here, after all the many perils and troubles of the sea, he found good anchorage for the remainder of his life; so that over its door might have been written, "*Post tot naufragia, portum.*"

When he settled down near London he began to look out for some occupation, and took an active part in the semi-professional societies of which he was a member, chiefly in the ROYAL GEOGRAPHICAL SOCIETY. It certainly tells against the ideal faculties of the English race, that notwithstanding their love of maritime enterprise, as displayed throughout their history, there was no kind of public Association for the promotion of geographical knowledge until this century. Associations there were for the material benefit of the mariners' craft, but none for the general advancement of geography, until 1830, when a few of the more scientific travellers and sea captains, as Sir J. Barrow, Sir J. Franklin, Colonel Leake, Captain Beaufort, the geographer Horsburgh, and others, out of the modest matrix of a Geographical Club produced the Geographical Society. Even then not a success for many

years, until in 1847, Mr. W. J. Hamilton, the President, took the broader view that "it is by the union of scientific truth with popular interest that geography will take hold of the public mind in this country;" and he being fortunately followed by Admiral W. H. Smyth, a man who combined sound science with a love of general knowledge and of art, the Society began then to take the place in popular estimation which it has held with increasing credit ever since. Much was doubtless owing to the development about that time of our Colonial and Indian interests, in which process the Society has managed to occupy a prominent position, by affording to all classes of the community concerned in that development, a common ground on which to discuss the material matters of position, resources, climate, and population. Towards this the able and genial Sir R. Murchison, who was frequently President, played an important part, through his varied knowledge and high position.

Mr. Clements Markham (Hon. Secretary), in his 'Fifty Years' Work of the Royal Geographical Society, 1881,' says, "Admiral Sir R. Collinson was awarded our Founders' Medal in 1858 (for his Arctic Exploration). He has since worked hard for our Society as a most active Member of Council and Vice-President during eighteen years, from 1857 to 1875. In the latter year he was obliged to retire, owing to the pressure of his duties as Deputy Master of the Trinity House."

The HAKLUYT SOCIETY is an offshoot from the Geographical, formed in 1847 for the purpose of printing rare and unpublished voyages, and therefore called after the great historian of travels and voyages in Queen Elizabeth's reign. Captain Collinson joined it, and edited one of the many books of travel published by the Society, namely, the 'Three Voyages of Martin Frobisher.'

The ROYAL UNITED SERVICE INSTITUTION is one of those semi-public associations of which we have many examples in England, and which arise from the combination in the English mind of a spirit of independent inquiry with a high respect for a thority. Two great Government institutions

for the infirm officers and men of the two war services had existed for many years at Greenwich and at Chelsea, the former of which is now a college for the officers of the Royal Navy; but it was felt that something more was wanted in connection with those two services for preserving the records of the deeds of the Army and Navy, and also for specimens of the weapons and war material of each age. In 1831 a Society was formed for these objects by the efforts of a few zealous officers of the two services; among these may be specially mentioned Major-General Sir H. Douglas, Lieut.-General Sir Herbert Taylor, Captain Beaufort, R.N. (Hydrographer), Captain W. H. Smyth, R.N., and (for his great services in subsequent years) Lieut.-General Hon. Sir James Lindsay. Thanks to the support given to the scheme by King William IV. the Society obtained from the Government part of the premises they now occupy; and in 1844 they had achieved so great a success among the officers of the Army and Navy that they were able to purchase the lease of the rest of their present abode in Whitehall.

The breaking out of the military spirit over all Europe soon after the Crimean War, was strongly felt in England; giving a fresh development and a new purpose to an institution of this kind. It was seen that it offered a favourable and safe ground for the discussion of the manifold inventions and ideas which then began to pour forth in connection with all sorts of war purposes, naval and military. Papers for discussion on these subjects were now read at the Institution; and the publication of them to the members in the form of a periodical journal, spread the knowledge of them over the Army and Navy, and at the same time formed a record not only of the subjects themselves, but also of actual war operations, available for future use. It has now taken such deep root in the two services, and has been of such assistance to the responsible authorities in throwing light on such matters, that it has become one of the recognised institutions of the country; nevertheless, at the present time of writing, though it has a very good name, it can hardly be said to have a secure local habitation.

In 1860 it was re-established under a Royal charter as the "Royal United Service Institution," for the promotion of Naval and Military Art, Science, and Literature. It now contains a library of 20,000 volumes of professional works of all countries, and a very large collection of maps and charts, and a museum filled with objects of historic interest in connection with war. It has, in fact, owing to the re-awakening of the military ideas of the country, quite outgrown both the building and the original conception. An institution for these objects, although it should be mainly supported by the voluntary contribution of the officers, as indeed it is, and always has been, requires also both a moral and material support from the Government of the country, and which support is best given in the form of a suitable building.

A short history of the Institution was compiled by the present Secretary, Captain B. Burgess, in 1887.

Captain Collinson was one of the original members of the Institution, and was elected Member of the Council in 1858, and a Vice-President in 1870, which latter post he retained until his death in 1883. In 1875 he contributed a paper on "Experiments in Fog Signals for Nautical Purposes, recently made by the Trinity House."

In 1861 he served on a mixed Committee of Army and Navy and Colonial Officers to report on the condition and probable use of certain lands in CANADA, reserved or obtained at different times for defensive purposes. As the defence of Canada includes not only that of the seaboard, but also the whole frontier towards the United States, this inquiry involved the examination of establishments and places along the banks of the rivers and lakes which form that frontier; practically, as far as this inquiry was concerned, from the sea to Lake Superior, a length of nearly 2000 miles. As is was therefore mainly a question of the defence of rivers and lakes, it was quite in Captain Collinson's particular line; and as he had friends in Canada at the time, notably the Commander of the Forces, General Sir Fenwick Williams of Kars, this little expedition was an enjoyment both professional and private. His reports, without intention on his

part, clearly demonstrate the want of due consideration for the future independence of the Dominion of Canada by British statesmen, when the boundary between that Dominion and the United States was settled.

The seven years from 1855 to 1862 was to him, on the whole, a period of despondency and anxiety. Without active professional employment, or any prospect of it, and on the half-pay of a captain, was a poor result for thirty years of such creditable service afloat, considering also that on his return from the Arctic seas he was only forty-four years old. He was put on one or two professional committees, but the only one that carried with it any sort of recognition of his position in the service was the Royal Commission on the National Defences, on which he served a short time.

It was through the semi-public and civil institutions that he was brought forward once more, and obtained a position more suitable to his professional character. And the Trinity House was the principal means of bringing this about: of this corporation he became a younger brother in 1858.

In 1862 he was promoted to the rank of Rear-Admiral, and in 1875 he at last received from the Admiralty some recognition of his Arctic service, in a recommendation to Her Majesty to advance him to the rank of a Knight Commander of the Bath. In his letters on this latter honour he showed the feeling of personal loyalty to his Sovereign which he had inherited, and which had been a ruling influence throughout his life. During his service as Deputy Master of the Trinity House he was brought into direct personal communication with His Royal Highness the Prince of Wales (who acted for his brother the Master, then frequently absent on duty afloat); and he frequently spoke of the assistance he obtained from the kindly attention and practical sense of the Prince on all occasions on which he had to refer to him on the business of the corporation.

Besides taking a part in the above-mentioned congenial and semi-professional associations, he thought it his duty, as his father had done before him, to assist as far as in him lay in the local institutions of the place he was living

at. He was a churchwarden successively in two churches in Ealing, Christchurch and St. John's, and was on the building committee for the erection of the latter; in which by the kindly feeling of the incumbent and of the parishioners a memorial window to him has been placed. He was Treasurer to the Ruri-Diaconal Association of the district, and served on the Local Board of Ealing, being chairman of it for a time.

He also took part in the formation of "The Army and Navy Co-operative Society," an undertaking which was started in 1870 by Major F. B. Macrae (formerly of the 8th Queen's Regiment), and some other officers, for the purpose of supplying the officers of the Army and Navy, both at home and abroad, with all kinds of articles they required, of a sound and good description, and at moderate prices—a most legitimate and beneficial object, and much wanted at the time, as has been proved by the extension of its business to all the stations of both services at home and abroad. It has developed into a very much larger and more comprehensive concern than any of its founders contemplated, or than its first chairman, Admiral Collinson, desired. He served in that capacity from its commencement until his duties as Deputy Master of the Trinity House compelled him to give it up.

## CHAPTER VII.

### THE TRINITY HOUSE.

### 1862–1883.

THE foregoing associations were not, however, sufficient for either his energies or his wants; there was still the desire of some sort of definite professional duty, and with a view to that object he got appointed a Younger Brother of the Trinity House in 1858.

The Fraternity of the Trinity House is one of those guilds which from ancient times have existed in this country for the support and regulation of different crafts. This one was for the benefit of the mercantile seafaring business of the country. Why it was launched under the patronage of the Holy Trinity does not appear, but there certainly existed in the Middle Ages fraternities under that dedication and for that object in some of the principal ports of this kingdom. That of the Port of London was naturally the principal and head of them; but there is one in the town of Newcastle-on-Tyne which is still occupying the same building that was obtained for the purpose in 1492; and also one in Hull, still occupying its ancient house, where there is a nautical school, besides almshouses. By the 'Account of the Trinity House, London,' written by Mr. J. Whormby (Clerk of the Corporation), in 1746, it appears that there are records in the Hull Trinity House dated 1357, and "authorities" for its establishment from Henry VI., Edward IV., and Henry VII. The first Royal Charter of the London Trinity House, given by Henry VIII. in 1514, implies the pre-existence of an organised body for a long time before. A short account of this Corporation was compiled and printed by Captain Sir F. Arrow (then

Deputy Master of it) in 1868, when His Royal Highness the Duke of Edinburgh became the Master. The original powers and duties of the Corporation were very extensive: the Charter of Henry VIII. gave licence to the "Mariners of this our Realm . . . to establish the Guild . . . and authority of making laws, for the Relief and Increase of the Shipping of this Realm." It was closely connected with the Royal Navy, so that, says Sir F. Arrow, "it became as it were a civil branch of the English Maritime Service, with a naval element which it preserves to this day." The Charter, as renewed by James II., gave the Corporation a certain power of trying marine causes at law; and of appointing pilots for the Channel as well as for the Thames; and of treating on "the Government, and maintenance, of the Navigation of this Realm—and of all Mariners, . . . coming within the Thames . . . and upon all articles touching . . . the science of seamen . . . &c.;" also of providing for the relief of the poor Brethren of the Guild, and of any poor mariners; and for punishing insubordinate seamen. And the Charters of Elizabeth gave authority to set up beacons and marks on the coast, and to supply ballast for ships out of the dredging of the Thames.

The Corporation, therefore, was evidently intended to be the medium between the Government and the Mercantile Marine for the general regulation of that national business. And in those days when every sea voyage was one of adventure, and generally of fighting, the Trinity House must have been a very important body in the realm; as indeed is shown by the names of great persons then belonging to it. But these powers and this position became reduced, as the shipping interest increased beyond the power of control by any one central body; and perhaps the final break from all such control took place when the Navigation Laws were repealed, which had imposed great restrictions on all foreign ships trading with this country and its dependencies. General laws for the conduct of the Mercantile Marine were substituted for the control of this Marine Corporation: the greater liberty of action thus given to individual shipowners and

masters, though only reasonable under a policy of complete free trade, has brought with it some disadvantages to the Merchant Service as a national institution; and from the point of view of the composition and standard of that service for national purposes, it may be doubted whether the control of a body like the Trinity House of seafaring persons elected from the Merchant Service, would not be more satisfactory than the administration of Acts of Parliament by the officers of a Government Department. Indeed the establishment of "Shipmasters' and Shipowners' Associations" of late years seems to show that some further regulation of the Merchant Sea Service was required.

The duties still left in the hands of the Trinity House may be best judged from the list of committees through which their work is mainly done, as enumerated by Sir F. Arrow.

1. That of *Wardens:* for *finance* and matters of general importance.

2. For *Ballastage* of ships, from the dredging of the river. But the general control and management of the river above Gravesend is now in the hands of another body, the Thames Conservancy, of which the Deputy Master is an *ex-officio* member.

3. For *Pilotage:* for the appointment and control of the pilots round the coast.

4. For *Lighting:* for constructing and keeping up the lighthouses, buoys, beacons, and light vessels all round the coast of England, excepting within river channels. This involves not only a great responsibility in the construction, but a constant visitation of the lights and buoys to see that they are in complete working order. And no person who has had the opportunity of accompanying the Elder Brethren on one of these tours of inspection can fail to admire the extreme care with which it is made, and the perfect order in which every part of this important branch is kept. The amount of work to be done in this branch may be judged from Sir F. Arrow's statement, that there were in 1868, under the Corporation: 76 lighthouses in 59 different positions; 38 light vessels off the coasts; and 452 buoys.

5. For *Examination* of the Masters of the Royal Navy, for the Pilotage of the Channel; and also of Pilots for the same, and for the Thames. This committee also deals with general questions affecting the navigation of our coasts, and with those relating to foreign and colonial harbours.

6. For the *Charitable Institutions* under the Corporation.

7. For the *House* itself; which has been on Tower Hill since 1798.

To which must be added the duty of acting as Assessors in the Court of Admiralty in cases where shipping are concerned.

*The Constitution of the Trinity House* is essentially the same as provided by the Charter of James I., and in Sir F. Arrow's time consisted of a Master, Deputy Master, four Wardens, fifteen Acting Elder Brethren, and ten Honorary Elder Brethren; and an unlimited number of Younger Brethren. Since that time the number of Acting Elder Brethren has been reduced to its original strength of thirteen.

The Younger Brethren have no duties, excepting to take part in the election of the Master and Wardens. The other parts of the Corporation form the governing body; and for all ordinary duties, the Deputy Master, Wardens, and Acting Elder Brothers carry on the business; the Deputy Master, and many of the Elder Brethren, attending every day to superintend the execution of their decisions. The Deputy Master is also the commanding officer of all the officers and men employed by the Corporation. The Master is always some official person of high position; at the present time His Royal Highness the Duke of Edinburgh holds the post.

The revenue of the Corporation is obtained from the light dues paid by all vessels coming to English ports, and from pilotage and other fees. But since 1853 the light dues are all paid into a central fund, which includes some other sources of revenue, and is called "*The Mercantile Marine Fund*," and is administered by the Board of Trade, which is the Government Department controlling the Corporation; and the necessary sums for maintenance of the Trinity House Service are issued as required upon approved Estimates by that Department. Hence the Corporation are not so com-

pletely responsible as they used to be, as far as finance is concerned, for the extent or efficiency of their work.

It will thus be seen that the present duties of the Corporation, though limited as compared with those of the original body, are still extensive and of extreme importance; and it is a beneficial arrangement, that the execution of these duties is still left in the hands of a tolerably independent body of professional men, for they are all chosen from the Merchant Service, except the one or two taken from the Royal Navy. The remuneration they get for giving up so much of their time to this public service is not large, and there is hardly sufficient attraction for the younger captains of the Merchant Service, who would be valuable assistants in such a work.

Captain Collinson was elected an Elder Brother in 1862, and in 1875, on the death of Sir F. Arrow, he was unanimously elected by the Corporation to the Deputy Mastership, which post he held until his death in 1883. He was a Vice-Admiral when he became Deputy Master.

## Fog-Signalling.

The following short account of some of the work done by the Corporation during the eight years that Admiral Collinson was Deputy Master will give an idea of the variety and the importance of the duties in which he took part.

In 1872 the Corporation determined on investigating thoroughly the question of providing "signals by means of sound in foggy weather to convey to the mariner the same warning as that by means of lighthouses in clear weather." For even the most brilliant lighthouse becomes virtually non-effective in some of the fogs in this country, as any one can believe who attempts to walk the streets of London on such occasions. Two members of the Corporation, Sir F. Arrow (then Deputy Master) and Captain Webb (now Sir Sydney Webb, K.C.M.G. and Deputy Master), were deputed to go to the United States to get information on this matter. Captain Webb took a great personal interest in the subject from the commencement to the end of the investigation. A

committee of the Corporation was formed, of which Admiral Collinson was a member, and in 1875 he gave the results of the inquiry in a paper read at the Royal United Service Institution. Experiments were made with a variety of instruments then in use from this country and from the United States; in which latter country the subject was more advanced, owing to the greater necessity, by reason of the continuous heavy fogs off the north-eastern coast of America.

These experiments were carried on in a thoroughly practical manner by observing from the sea the effect of each instrument sounded in turn from the lighthouses on the South Foreland near Dover. Day after day the instruments went on sounding at certain pre-arranged hours, while the steam vessel containing the judges moved about in the Channel to test the sound in different positions and under different conditions of weather. The Committee also had the assistance of Dr. Tyndall, Professor of Natural Philosophy at the Royal Institution, who was then the scientific adviser to the Corporation. The final verdict was unhesitatingly given by all concerned in favour of an American fog-horn, named the *Siren* (so called, no doubt, in grim humour from its discordant voice). This is a cast-iron trumpet some 12 or 15 feet long, through which a blast of steam or compressed air at a pressure of 70 lbs. per square inch is blown; at its entrance are two discs, each perforated with the same apertures, and one of which is rotated by machinery, so that the steam passes through in successive puffs, as the holes in the rotating disc come opposite those in the fixed one. The note produced therefore depends on the rate of rotation, and so far is independent of the length of the horn. The peculiar discordant noise of this instrument, which makes it so effective, is probably due to the difference of the note of the discs with that of the horn itself. The most effective rate of rotation was found to be 2400 to 2800 revolutions per minute. Dr. Tyndall's opinion is quoted in the above paper, as representing that of the Committee: "It is beyond question the most powerful fog signal which has

hitherto been tried in England, especially when local noises, such as wind, rigging, waves, surf, &c., have to be overcome. What may be with certainty affirmed is, that in almost all cases the Siren, even on steamers with paddles going, may be relied on at a distance of two miles, and in the majority of cases at a distance greater than three miles." This may not seem to the landsman a very effective distance, but the Trinity House, in all their public notices to mariners, are careful to give the minimum effects, and if the warning is close to the danger, those distances will in general give time for a vessel to escape from it.

The other instruments tried were steam whistles of large size, air-horns with sounding *reeds*, and various small guns. But, though the Siren was superior to any of these for places where steam-power can be obtained, there are other cases, such as lighthouses on rocks, light vessels, and vessels generally, where some simpler apparatus is required. Two other papers were read on these subjects at the United Service Institution at the same time: one by Major Maitland, Royal Artillery (then in the Gun Factory of the Royal Arsenal, Woolwich), on "Experiments with Explosive Substances," which demonstrated the superiority of gun-cotton, fired in the focus of a parabolic reflector, over guns and gunpowder; the other paper was by Captain J. C. Richards, R.N., suggesting the employment of two notes in fog-signalling for vessels under weigh, by which a sort of code of signals could be established. Admiral Collinson's opinion was rather against any attempt to rely on the precise observance of different notes; but experiments were made upon the effect of sounding two notes of different pitch in succession, a high and a low note in direct contrast, and the results obtained were so satisfactory, that this form of distinctive character is very generally adopted in this country.

Another simple form of moderate fog-signal was proposed by Admiral Collinson. This was a rocket which contained a charge of gun-cotton or other detonating substance; and this, on experiment, was found to be so safe and easy of application, that it has now displaced the old-fashioned and

more expensive gun signals which were used at certain stations.

In the course of these experiments, Dr. Tyndall made some discoveries on the propagation of sound through different atmospheres, which were contrary to the received notions before that time. They found that on days when "the optical purity of the air was sensibly perfect the acoustic imperviousness was very great. Neither guns nor trumpets were able to pierce the transparent air to a depth of three—hardly to a depth of two—miles." "This was proved to arise from an invisible cloud of aqueous vapour raised by a powerful sun," "from which the sound-waves were thrown back as the waves of light from an ordinary cloud." Whereas, during a fog, "the air in which the fog is suspended is in a highly homogeneous condition," and therefore favourable for the transmission of the sound-wave. The effect of rain was somewhat similar to fog, when the area of it extended over the whole space to the fog-horns—"we heard them at a distance of 7½ miles, louder than they had been heard through a rainless atmosphere of 5 miles."

## The Eddystone Lighthouse.

During Admiral Collinson's tenure of office as Deputy Master there were some rather important works in progress in the Lighting Branch of the Trinity House duties; such as the rebuilding of the lighthouses at the Longships, Eddystone, Bishop's Rock, Saint Catherine's, the establishment of new lighthouses at Hartland Point, Saint Tudwals, Bull Point, Anvil Point, Milford Haven; the installation of the electric light at the Lizard Point.

Of these works, the most interesting and the most typical of lighthouse construction in the present day is undoubtedly that on the Eddystone rocks off Plymouth. It had been known for some years that Smeaton's beautiful tower must come down; not from any defect in its structure, for on taking it down it was found to be quite good after withstanding for more than a century the heavy storms of that

sea, but because the rock on which it stood had become undermined and shaken by the shocks of the waves.

The designs for the new lighthouse were made by the Chief Engineer to the Corporation, Mr. James Douglass, C.E., who for his good service in this national work received the honour of knighthood on its completion; he, as is requisite for such a post, combined with his acquirements as a constructor, a knowledge of mechanical engineering, and of physical sciences generally, and of ships and the sea; besides having had a good experience of lighthouse construction. A full account of the building was read at the Civil Engineers Institution, by his son, Mr. W. T. Douglass, who was Superintending Engineer of the work, in November, 1883; and the discussion on it showed a high appreciation of the goodness of both design and execution.

It was determined to make it nearly double the height of Smeaton's tower, both to escape more of the action of the waves on the lantern and to utilise the greater lighting power of the present day over a wider area. And in order to avoid the danger of injury to the rock, as well as to keep the existing light in operation during the reconstruction, a more secure part of the reef of rocks was selected. The peculiar difficulty of construction was that the reef is only awash at low-water spring tides, and therefore the lower part could only be carried on during two to three hours every day, and the frequent roll of the seas there made landing at all times precarious.

An important change in the form of the tower was made by the introduction of a cylindrical base rising a few feet above high water and larger than the tower itself. The object of this was to break the force of the waves and prevent them running up the tower, which in Smeaton's occurred to so great an extent as to damage the top and even to shut off the light for a distinct interval. The success of this base was shown during a storm when both towers were standing. Sir J. Douglass, at the discussion, said that in a more exposed position he would make the base ten feet higher. The curve of the exterior of the tower is a very flat ellipse,

though why that particular curve was selected does not appear.

*The Construction.*—The whole of the building is made of granite from the quarries of Dalbeattie in Dumfriesshire and De Lank in Cornwall, of which Sir J. Douglass said, "It would be impossible to procure from any quarries of the country a mass of granite of the same dimensions more perfectly homogeneous." The stones were cut to shape at the quarries, and as they were all dovetailed together, both horizontally and vertically, and as each course consisted of a different arrangement of rings, in order to obtain a vertical bond, the stones in each course varied in size and form. They were landed at Plymouth and carried to the rocks in the steam tender which took out the workmen every day; the landing and hoisting was also done from this steamer, by an ingenious arrangement of blocks and chains; and as they ran to a weight of two and three tons each, this adaptation of the steam-power of the vessel greatly facilitated the work. The first operations were of course the most troublesome, as the natural rock was hardly above low-water line. A central platform, 10 feet diameter, was first quickly built of small stones; and then a coffer-dam of brickwork enclosing the base and rising a few feet above low water; and to clear this of water each tide the pumps of the steamer were cleverly brought into use. The foundation stones of the cylindrical base were sunk one foot into the rock. Another special feature of the work was the thinness of the mortar joints; these were composed of the strongest Portland cement and granite sand. The whole of the constructive work on the spot was done by daily labour under the direct superintendence of the officers of the Corporation; this arrangement was undertaken in consequence of the high rates of the tenders received for the work, and it was not only, as might be expected, more satisfactory, but cheaper in cost, the whole amount being 23 per cent. less than the estimate.

## The Lighting.

There are three modes of producing light for this purpose now in use—*electricity, oil,* and *gas;* and two principal modes of applying optical apparatus to concentrate the light—the *catoptric,* by reflection from opaque surfaces, and the *dioptric,* by passing it through glass lenses.

*Electric light,* as applied to lighthouses, is obtained by passing a current of electricity from one carbon pencil to another nearly touching it. The intensity of this light is so great, with the power generally used for creating it, that Sir J. Douglass says it is 200 times (per square inch of focal area) that of the best oil or gas flame; and it is not only the most powerful luminary, penetrating the greatest distance for coast light purposes, but it is the cheapest per unit of light produced. Indeed the greatness of its power is sometimes an obstacle to its employment; for it is difficult to judge its distance, as can generally be done with oil light, by the intensity of the light seen; so that in the English Channel, which has electric lights both on the French and English shores, it has been found to be so confusing, that at the Dungeness light oil has been substituted for electricity. And of course it is only possible to employ electricity at places where the steam machinery, or caloric engine-power required to make it, can be erected.

*Oil and Gas.*—About the time when the Eddystone Lighthouse was rebuilt a controversy was going on between the Trinity House and the Dublin Commissioners of Lights as to the respective merits of oil and gas for this purpose. After a long series of experiments, the Trinity House came to the conclusion that oil gave as effective a light as gas, when used under equal conditions, and that oil was the most convenient and the safest mode of obtaining the light. The oil generally used by the Corporation is mineral oil, but in lighthouses on detached rocks, and in light vessels, a specially safe oil is used, having a flashing point as high as 250° F.

The light put in the new Eddystone Lighthouse is one of

the best examples of the most complete oil light at present in use. The burner used is about 8 inches diameter, having six concentric wicks, with spaces between them through which the air passes, and metal deflectors round the outside and in the centre, by which the flame is concentrated and supplied with air. A second similar burner is placed about 6 feet above the other, the consumed gases being conducted by special tubes into the roof of the lantern. These two burners are surrounded by vertical dioptric lenses, forming a little chamber of glass about 6 feet across and 12 feet high, in six panels, and therefore hexagonal in plan. The lenses are made according to the mode that has now been in use for many years; that is, not in one piece of glass of great thickness, but having a small solid centre, round which are separate concentric rings of glass, of such a cross section as to refract the light in the same way as if they formed part of a continuous lens. And there is a special arrangement of these compound lenses, in this case, the lens in each panel of the hexagon being divided in two parts vertically. And as there is a separate set of these lenses to each of the two burners, there are therefore twelve semi-lenses to the lower burner, and twelve to the upper one. The effect of these lenses, so divided in two parts vertically, is to send out from each burner through each semi-lens a beam of light, of a conical form, whose vertex angle is 7°; the division of the lens makes a distinct interval of darkness between the two beams; and the hexagonal arrangement of the panels makes a longer interval of darkness between every pair of beams. Thus from the two burners there are twenty-four of these beams of concentrated light flowing towards all points of the compass; and by clockwork machinery the whole hexagonal chamber of lenses is made to revolve at such a rate as to give a flash of light of three and a half seconds duration, then an interval of three seconds of darkness, then another flash, and then an interval of twenty seconds of darkness. This order of alternate flashes and eclipses forms the special characteristic of the Eddystone light. The size and number of the beams of light depend on the arrangement of the

lenses; the length of the flashes and of the eclipses depends on the rate of rotation.

The dioptric lens is now generally used for all important lights, because it enables the burners to be concentrated into one, and permits the utilisation of the whole light in any particular directions that may be required. In the lower chamber of the Eddystone Lighthouse there is a catoptric arrangement by which the light of a burner is reflected in one direction to a shoal 3½ miles distant.

The hexagonal chamber of the glass lenses is enclosed in another glass chamber, of circular plan, about 14 feet in diameter and 14 feet high, the glass of which is thick plate fixed in iron frames. This is called the lantern, and has to withstand the occasional impact of the salt water, and the force of the winds, and the rush of birds who at certain seasons in their passage are attracted by the light.

The full power of each of the two burners is calculated at 950 of the standard candles; but the power of the whole concentrated light of both burners, when passed through the lenses, is calculated at 159,600 candles. This shows a remarkable advance in the knowledge of lighting since the time, one hundred years before, when Smeaton erected his tower, and lighted it with twenty-four tallow candles without any optical assistance, producing, it is calculated, a power equal to sixty-seven candle units. The only mechanical arrangement used in that lighthouse appears to have been a clock which struck the half-hours, telling the keepers when it was time to snuff the candles.

At the Bishop Rock and Round Island Lighthouses, Scilly Islands, double dioptric oil lights have been recently installed, having burners of eight and ten concentric wicks and lenses, nearly 50 per cent. larger than the first order dimensions of present use. The flashes from these apparatus, which are at present the most powerful oil lights in the world, have an intensity of nearly half-a-million of candles.

*Memoranda of the Eddystone Lighthouse.*

First work on the rock begun . . . July 1878.
Lantern first lighted up . . . . May 1882.

This period, less than four years, was one year shorter than the estimated time.

Height of focal plane above high water . . 133 feet.
„ „ in Smeaton's tower . 72 „
Nautical range „ „ . 17½ miles.
Total cost, including plant . . nearly £60,000

being the cheapest, per cubic foot of masonry, of any recent important lighthouse.

Round the cornice of the serving-room under the lantern, the Corporation, true to the religious side of their institution, and with a thoughtful respect to the builder of the old tower, have inscribed the solemn warning which was written on its walls: "*Except the Lord build the house, they labour in vain that build it.*"

## Buoyage.

This is one of the many subjects appertaining to the Trinity House which turned up for special consideration during Admiral Collinson's time. A buoy is a floating mark anchored by a weight and chain to point out a danger in a channel. As long as vessels were moved by sails, and time was not so much considered, a few buoys only were necessary to mark the principal channels to a port; but when the number of vessels increased and were chiefly propelled by steam under pressure of time, it became necessary to mark all the possible channels, and to mark them thoroughly for use by day or night. Hence followed the necessity for a variety of kinds of buoys to indicate the different channels; and further came the principle, as stated in the report of the Committee of 1882, that the buoys must indicate *not only the danger, but the path of safety.*

The Trinity House had before attempted to reduce the "Buoyage" under their control to a uniform system; so that

a navigator would know, whatever port he was coming to, that a certain buoy indicated a safe channel in a certain direction from it, but as there were two other partly independent jurisdictions in this matter in the United Kingdom, their ideas could only be applied to a certain part of the coast. It was on the initiative of the Commissioners of Irish Lights in 1882 that the Trinity House moved again in the matter, with the object of establishing a uniform system of marking channels throughout the United Kingdom.

With the agreement of the Government, a Conference was set on foot to discuss this matter, consisting of twenty members representing the following bodies:—The Trinity House; The Commissioners of Irish Lights; The Commissioners of Scottish Lights; The Admiralty; The Board of Trade; and the Conservancies of the Thames, the Humber, the Tyne, the Clyde, the Mersey, and the Tay. The Conference sat at the Trinity House, London, and was presided over by the Master, H.R.H. the Duke of Edinburgh. A committee was appointed to take evidence and submit suggestions, which consisted of ten representative members of the Conference, and the chairman of which was Admiral Sir R. Collinson, as Deputy Master of the Trinity House. In the course of four months the Committee examined eighteen witnesses, chiefly master mariners and harbour masters, and during the next six months discussed the subject; and in March, 1883, made a report to the Conference, which in April confirmed the report, with some additions which had been left for their decision.

The majority of the witnesses, as well as of the Committee and of the Conference, agreed in this main idea, that *form of buoy rather than colour* ought to be the distinguishing mark; but as the form of buoys suitable for exposed channels is limited, it was necessary also to employ colour to distinguish the channels and dangers when numerous. With regard to the form, two main kinds were agreed to, as especially distinguishable from each other under various conditions, viz.: *the can buoy* (as it is called), being something of a barrel form, showing a flat top out of water; and *the conical buoy*, showing

a cone top out of water. With regard to colour, there was considerable difference of opinion: two "single" colours have been generally used, black and bright red, "single" signifying one uniform colour over the whole buoy; but it was generally allowed that under many circumstances black and red cannot be distinguished from each other at sea. Parti-coloured buoys are also used, of black and white, or red and white, in stripes or chequers; these are liable to give a wrong impression from the effect of the white in making an apparent change in the form, but they were allowed to be necessary in order to provide the requisite variety. It was also agreed that, in order to indicate on which side of a buoy the safe channel lay, the buoys on the *starboard or right-hand side of a channel, when going into port, shall always be of one pattern,* THE CONICAL, *and of one single colour, black or red;* and that the buoys on the *port, or left-hand side of the channel, when going in, shall always be* CAN *buoys, and of a single or parti-colour,* as may be determined by the local authority.

Some other special forms of buoys were agreed upon to mark particular points in complicated estuaries.

And in order to make these rules generally applicable to coasting navigation, as well as to harbour channels, it was agreed that the *direction of the flood tide* (which is always marked on charts) shall determine the starboard and port sides of a channel on the open coast, as regards the character of the buoys.

Hence, in the future, a mariner navigating along the coasts and harbours of the United Kingdom, whenever he comes across *a conical buoy* of a single colour will know that it is on the starboard side of the safe channel when looking in the direction of the flood tide; and if it is *a can buoy* it is on the port side of the safe channel. It is a pity the two names for the buoys could not have indicated the respective sides, especially as those adopted are rather similar and somewhat arbitrary.

A remarkable consensus of opinion, not altogether unknown in other inquiries of a similar character, appeared among the

witnesses on this occasion; namely, that they all agreed on the necessity of having one uniform system for the whole kingdom, but each qualified that opinion with the proviso that his particular system should be the one selected.

In the course of the Conference, Mr. T. Stevenson, the Consulting Engineer of the Scottish Light Board, put forward a plan for indicating the direction of the danger by the character of the buoy, which would be applicable to all places and all countries. This was by having one form and colour of buoy for the north side of a danger, one for the south side, one for the east side, and one for the west side; four different forms and colourings which would answer for all purposes. Admiral Collinson gave some support to this idea by referring to the plan he adopted in taking the fleet up the Yang-tse-kiang River in China in 1842: a black signal at a buoy signified, "Pass to the north;" black and white vertical, "Pass to the south;" black and white horizontal, "Pass to the east;" white, "Pass to the west." These were frequently used, and no vessel got astray, though there were sixty-five sailing vessels and ten steamers. But, on considering the varied channels with which the Trinity House had to deal, he was obliged to abandon this idea; and the Conference, after consideration, thought it was not sufficiently practical for the purposes they had to meet.

## FINAL.

The work of the "Buoyage" Committee was the last public duty Admiral Collinson took part in. It had been evident that his vital power was greatly falling away for a year or two before, not by natural decay, but from a peculiar effect of that insidious disease the scurvy. Excepting that latent enemy, he had been remarkably healthy during the whole of his active service, both by constitution and by habit. Far from being ascetic or unsocial, he was equally averse from all intemperance or from self-indulgence of any kind: he had suffered from climatic complaints, and on one occasion was so prostrated by fever that his doctor thought

his case hopeless, and allowed him to take whatever he liked; fortunately his natural constitution turned his thoughts to bottled porter, which, to the doctor's surprise, restored him. To his last day he could boast that he had never paid a doctor's bill. But now the scurvy, which seems never to altogether quit a body it has once got a footing in, began to affect his teeth, and as from the same cause his gums were too tender to allow him to replace them, he came under the condition of having to exist mainly on soft food, on which, though it is possible for a man to live for some time, he cannot do much work.

Now, to men of Admiral Collinson's habits and temperament, work is life; to those who urged him to give up some of his more responsible duties, he replied, "I should die without some duty, so I had better die doing it." This is the tone which has given its character to the British Army and Navy. DUTY was, in fact, the watchword of his life. *First* to the Almighty Creator,—*the duty* of keeping himself ready and fit in body and mind to take the part in life that might be assigned to him, and the corresponding duty of treating others as having the same imposed upon them. This feeling raised his thoughts above his own personal advancement, and gave him a trust that others with him were actuated by the same ideas. And *Secondly,—the duty* to his country and to his Sovereign as representing that country. This prevented him going out of his way to look for openings suited to his own wishes; he took that which came to him in the way of his profession, as his appointed work, for the due completion of his part of which he was personally responsible; and accordingly he devoted all his energies to carrying through the work in hand, whatever his own ideas about it might be, and to overcoming all difficulties in the way, whether personal or otherwise. This single-minded determination gave him a reserved and sometimes severe manner, as he expected the same devotion from all those associated in the work. And he had that special characteristic of active able-bodied people that he was not happy unless he was working himself with his own hands;

he could not sit still and merely direct other people to work. Moreover, it had to be professional work, or at all events public work of some kind; those recreative pursuits of many men in retirement, writing, drawing, music or gardening, had no charms for him.

He had, however, determined that 1883 should be the last year of his Deputy Mastership; had he done so a year before, his life would in all probability have been prolonged for some years. Whether it would have been a life of pleasure or even comfort is doubtful. If a remedy could have been applied to his gums some years before he might have continued doing efficient service for a good time longer, as he was otherwise healthy in mind and body. Notwithstanding however his failing strength, he continued in the performance of important public duty to within five months of his death, and that is as worthy a termination to an active career in the Queen's service as any officer could desire.

He died in September, 1883, after lying a month between life and death in a state of half-consciousness.

He was laid beside his dear mother and sister in Perivale Churchyard, near Ealing, and over his tomb was placed a cross with an anchor bound to it, and these consoling words:—"AND SO HE BRINGETH THEM TO THE HAVEN WHERE THEY WOULD BE."

THE END.

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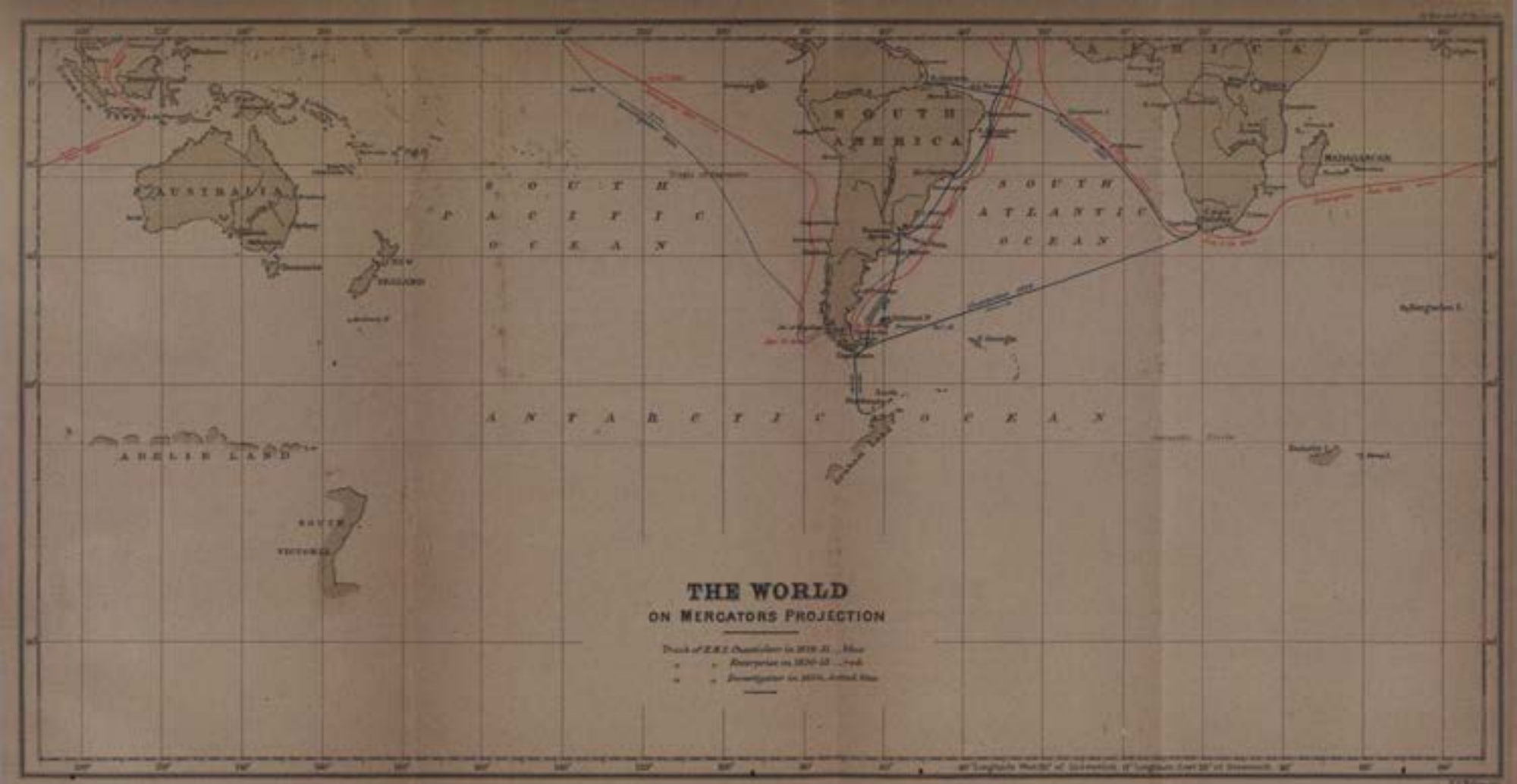
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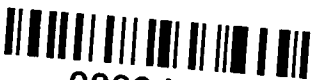
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